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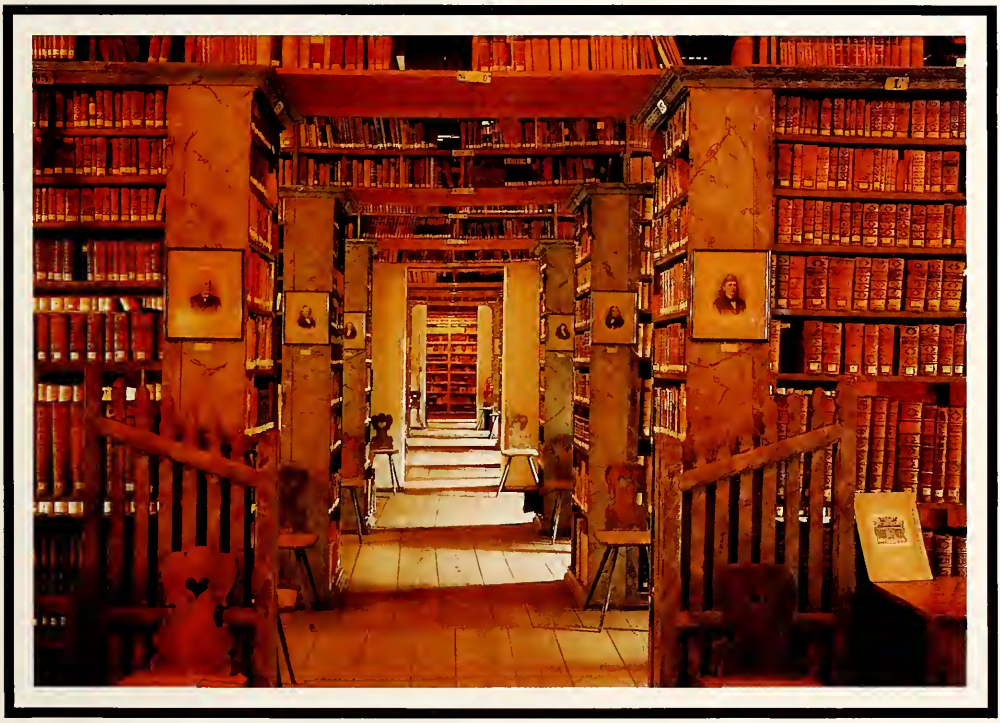
A Humanities Journal for Medicine and the Health Sciences



Eighteenth-Century Traffic in Medicines and Medical Ideas

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Introduction

Renate Wilson, *Guest Editor*

This issue presents a series of articles gathered with the goal of contributing to the history of medical ideas and medical resources that became available to the North American population over the course of the eighteenth century. The authors concentrate in large part on German medical thought, practitioners, and medicinals that originated within the larger European medical culture at the end of the early modern period. In North America, medical imports were major factors in the evolution and persistence of a distinct medical market and medical culture centered in the numerous and populous German-language communities. Their influence was not so much due to any substantive difference from English or French therapeutic models and general practice but because they were familiar to people who had lost their customary sources of care.

In most German territories of the time, people were accustomed to the modest but pervasive levels of structured care described, for example, by Mary Lindemann for the area around Braunschweig and Wolfenbüttel. While European medicine at the bedside and by trained providers was largely reserved to the monied classes in their homes and to the charity population in poorhouses and municipal and religious hospitals, the majority of people had access to a wide range of local ambulatory care–from the official town physici, to barber surgeons, to the whole range of early modern providers. Once ashore in North America, often beset by the morbid sequelae of naval passage and soon attacked by a variety of local diseases, immigrants to North America were on strange territory in more ways than one–climate, geography, languages, and medical flora. Even in rural areas, their reliance on familial self-help practices clearly could not exclude the use of apothecaries, midwives, empirics, clerical healers, or colonial physicians. The literature on colonial North American medicine shows quite an abundance of such providers. Important among them, because of their academic and Pietist provenance, their practical medical training, and their continuing pharmaceutical commerce with their motherhouse, was the network of Lutheran clergy sent over by the Francke Foundations in Halle.

The articles in this issue describe the European antecedents of some of those practitioners and their fit with contemporary practice. Renate Wilson, in telling the story of the famous Halle Orphanage medications, directs attention to the pharmaceutical trade in proprietary brands and the role of philanthropy as the economic backbone of much early modern medical care. Jürgen Konert compares the medical philosophies and the less-well-known medical practice of Georg Ernst Stahl and Friedrich Hoffmann, the two founders of the medical faculty of the

Friedrich University at Halle, and of their Pietist disciples.

Neither the traffic in proprietary medicines nor the fact that famous physicians engaged in it were restricted to our central European venue, of course, and the makers of the Orphanage medications relied in their claims for effectiveness on many of the objectives of pharmaceutical reform of the period. John Crellin takes up related issues in his discussion of how the setting and selection of dosages was one indication of careful physician practice and attempts at standardization. Crellin includes in his assessment an American practitioner of French Huguenot extraction, George de Benneville, who left an unpublished formulary containing a vast and eclectic armamentarium of materia medica.

The strong Paracelsian influence on de Benneville and on his classification of diseases is analyzed by J. Woodrow Savacool in comparison with the more traditionally academic approach of Christian Friedrich Richter, a student of Stahl's and, not incidentally, one of the developers of the Halle Orphanage medications. Richter's nosography, set forth in a famous self-help text advertising the medications, is far from Paracelsian or similar early modern schemes despite the fact that his greatest claim to fame was the development of a potable tincture of gold. The case of Richter demonstrates very well that medical propriety coupled to the search for profit from pharmaceutical production is neither historically distant nor an entirely modern phenomenon. It seems to have flourished well and early on German soil.

The Richter text was imported into North America by the Halle network, but as David L. Cowen shows in the concluding article (with modest support from Wilson), Richter had much competition. Beginning in the 1790s, American printers flooded the market with German imprints. Many were reprints from the vast European reservoir of *Kunstbüchlein* and books of secrets, including the tradition of astrological and even magical medicine. But many if not most also supplied useful information on veterinary medicine, how to make dyes, and how to handle female complaints. It is that type of medicine for which the German population in the middle colonies has become known; but as this issue shows, they were not the only resources available, nor the only ones used.

The authors are indebted to many. For sharing with us their insights into eighteenth-century general medicine, we thank in particular Richard Töllner of the University of Münster and J. Worth Estes of Boston University. Thomas A. Horrocks, director of historical programs at the College of Physicians, generously placed the de Benneville manuscript at our disposal, and Thomas J. Müller shared with us some of the recently restored treasures of the Francke Foundations. We are indebted to him and to the staff of the Francke Foundations for their help in accessing a large and complex body of rarely used materials.

Part of the work on this issue was made possible by a grant to the Guest Editor from the National Library of Medicine and by a collaborative grant from the Alexander von Humboldt Foundation, Federal Republic of Germany, held jointly with Jürgen Konert. A Glenn Sonnedecker fellowship from the Institute for the History of Pharmacy at the University of Wisconsin to the Guest Editor and previous support by the New Jersey Historical Foundation are gratefully acknowledged.

Education and the Cabinet of Curiosities at the Francke Foundations

Thomas J. Müller

When August Hermann Francke built a large and spacious complex of buildings to house the famous Halle Orphanage and its associated schools, he added a cabinet of curiosities for the instruction and edification of students. His successors enlarged the early museum in the 1730s, lodging it under the roof of the main building (where it is restored today) and housing its growing collections of scientific artifacts and specimens into sixteen specially built and richly decorated cabinets. Over time, the collection fell out of use and was believed lost or dispersed. But when the deteriorating buildings of the Orphanage complex were restored during the early 1990s, most of the inventory—including the cabinets and their contents—were found. Equally important, a large pharmacy display table was recovered, and within its drawers was a long-lost inventory dating to 1741. Those artifacts and the inventory permitted us to reconstruct the theoretical concepts and educational objectives on which the collection was built.

In line with the Pietist orientation to widening the access to useful knowledge, the collection was largely intended for instruction. For material support and patronage, Francke wisely courted the first Prussian king, Frederick I, a lover of the arts and sciences as well as a famous collector of natural curiosities. Francke's proposed cabinet of natural wonders was intended for class demonstrations so as to train students by practical observation instead of rote learning. He and his associates went to considerable lengths to provide such material for instruction in natural history, the arts, and manufacturing. Halle missionaries were encouraged to add to the collection with natural history specimens from India and North America.

They purchased telescopes, built an observatory, established a hortus medicus, and acquired equipment for experimentation and anatomical instruction. For the students training for careers as artisans, there were models of lathes, salt manufacturing equipment (Halle had been famous for its salt deposits since the Middle Ages), and a printing press. Even today, the contents of two cabinets reflect the highly utilitarian and instructional orientation.

One artifact, in a large red cardboard box with a semicircular cut-out roof topped by a chimney, contains scale models of furnaces, stills, and similar apothecary equipment that might have been found in the laboratories dedicated to producing the Orphanage medications (see photograph on opposite page).

Another and quite extraordinary artifact is a drug display table that may well be among the oldest extant items (see page 27). The construction suggests both its practical use as well as elements of a

Models of chemical stoves and retorts for the preparation of medications. This small but true-to-size model is one of a range of displays for instructing Halle Orphanage students in the arts and sciences. (Photograph by Klaus E. Göltz, Halle)

museum display. The table top consists of two equally large wooden frames surrounding two locked covers. When raised, they reveal numerous square compartments that hold the rich and varied materia medica of the period. The top when open was fitted with wiremesh frames to protect its contents. Remaining inscriptions for many of the compartments indicate the variety of items displayed—from tropical coffee beans and botanical simples to pieces of skull and powdered bone. Of artistic interest is the top cover of the table, which bears a faded but still discernible set of overlapping semicircles providing an unlimited perspective. The Orphanage building was finished in 1701, and the Orphanage pharmacy occupied part of the lower floor of the main wing. It seems not unreasonable to assume that the table was originally built for pharmacy use and was only subsequently added to the cabinet of curiosities inventory, which lists it as a mineral display case in 1737.

SOURCE NOTE: A full description of the rediscovery and reconstitution of this large early modern cabinet is in preparation as part of a detailed catalog. For its place in the educational strategies of the Francke Foundations, see Thomas J. Müller, "Der Realienunterricht in den Schulen August Hermann Franckes," *Schulen machen Geschichte, Kataloge der Franckeschen Stiftungen 4* (Halle: Franckesche Stiftungen, 1997), 43–65.

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The Traffic in Halle Orphanage Medications: Medicinals, Philanthropy, and Colonial Mission

Renate Wilson

The Francke Orphanage Foundations, founded in 1694–1696 as a center of German Pietism, were dedicated to a wide range of social and religious reforms, in particular of education and charity. In collaboration with similar Danish and English institutions, the Francke Foundations also entered into the field of foreign mission to India and North America over the course of the eighteenth century. A major portion of their resources derived from the shrewd pursuit of a highly successful pharmaceutical manufacture and commerce and a large trade in Bibles and edification literature. That commerce, for which the Pietist missions abroad provided one channel of distribution, was the financial backbone of the foundations. It created a highly focused and self-contained mechanism for generating profit, maintaining a large network of charitable donors and recipients, and supporting the Halle clergy abroad.[1]

The Economic Rationale

In seeking a profitable and independent economic base for domestic reforms and colonial missions, the Francke Foundations were not the first to enter into the production and sale of Bibles and edification tracts and of pharmaceutical products. The juncture of medical care and Christian teaching was part of both Protestant and Catholic practice during the early modern period.[2] Many early Protestant clergy in North America also practiced medicine according to accepted Galenic and Paracelsian drug therapies.[3]

But in several respects, the Halle Orphanage commerce enjoyed unique advantages. It differed in important respects from the cross-continental pharmaceutical trade of the early modern period, much of which centered on imports of exotic materia medica from New Spain, China, and the East Indies, including the Venetian theriac trade.[4] What we know of exports to North America was part of the trade in simples and some patent medicines.[5] By contrast, the Halle Orphanage Foundations created and exported a well-defined set of proprietary remedies that were the major if not the exclusive focus of its commerce. Its success was based on consistent quality, which physicians and patients repaid by brand recognition and loyalty. Moreover, the profits accrued entirely to a charitable enterprise that took great care to preserve its philanthropic status and reputation. Gifts and bequests on behalf of Pietist

missions were often channeled wholly or in part to pay for the products of the pharmacy and the printing houses, which then sent their products abroad for charity distribution and sale.[6] In several respects, the commerce was part of the trade in colonial, military, and maritime physic, or medicine, chests; in others, it prefigured the later sale of proprietary medications whose composition was jealously guarded (for commercial as well as medical reasons), such as the Thomsonian medicines and the homeopathic preparations of Samuel Hahnemann.[7]

The Halle Orphanage began pharmaceutical manufacture in the early 1700s, based on considerable early investment to develop production laboratories for several recipes that pious testators had left to the founder, August Hermann Francke, in the furtherance of his goals.[8] Both manufacture and trade took off in earnest with the development in 1702 of *Essentia dulcis* (Sweet Essence), a potable tincture of gold. By the 1720s, the trade in medications had become a highly profitable enterprise. It remained profitable until the latter part of the century.

After a period of experimentation, a final selection of eleven to thirteen medications combined in various quantities in physic chests became the standard Halle commercial offering; that offering remained fairly stable in composition and price over the entire eighteenth century.[9] The major exception was *Essentia dulcis*. Although that remedy re remained prominent as a general tonic, particularly in shipments to Russia in the first two decades of the century, its price was halved in the 1720s to counteract accusations of undue profit.[10]

The medications were prepared and marketed under a special royal privilege that exempted the Francke Foundations from regulations governing the apothecary trade. Locally, they were used in the orphanage hospital (founded in 1708) and in a large dispensary, which between 1718 and 1770 was serving an average of twelve thousand charity and paying patients per year.[11]

The domestic and foreign trade operated through associated apothecaries and commercial houses as well as such special private agents as university professors, Pietist clergy, and Lutheran missionaries in the Baltic territories, Russia, and India. Early successes abroad were obtained through Pietist partners in the Russian trade to Riga, Moscow, St. Petersburg, Tobolsk, and Archangelsk, which peaked between 1709 and 1717. Beginning in the 1720s, the trade extended throughout continental Europe and England. Through agents in Amsterdam and Rotterdam, it went as far as the East and West Indies, including North America.[12]

Both clerical and commercial agents were protected by local privileges and patents, including an Imperial privilege in Catholic areas under Austrian rule where like-minded Pietist associates established a market in the Hungarian provinces, the duchy of Siebenbürgen and the Banat. Strict quality control ensured that the pharmaceutical privilege of the Francke institutions and the reputation of their products remained intact in the face of continuous opposition by guild apothecaries, outside agents, and occasional falsifications. Prussian medical authorities also attempted, largely unsuccessfully, to bring the commerce under their control after the health reforms of 1725.[13]

The Halle Orphanage Medications and Their Uses: Pharmaceutical Reform and the Need for Reliable Medicines

A full, coherent, and elaborately argued rationale for the development and use of the so-called Orphanage medications can be found in a series of popular medicine texts. Those were developed between 1700 and 1710 in parallel with the medications that came to constitute the Halle armamentarium. Sold separately and as components of the physic chests, the texts were authored by a developer of the medications, Christian Friedrich Richter, a student of Georg Ernst Stahl's. After Richter's death in 1711, the major text, the *Höchstnöthige Erkenntnis vom Leibe und natürlichen Leben*,[14] was reedited and published by his brother Christian Sigismund Richter and after his death by the latter's son-in-law, David Samuel von Madai, a Hungarian physician trained in Vienna and a respected author on fevers.[15]

Madai took over the pharmaceutical trade in 1740 and published a condensed and largely commercial text in 1746, which was translated into many languages (including Latin, French, Dutch, Tamil, Russian, and modern Greek).[16] The twelve-hundred-page original Richter text was divided into two major sections of twenty chapters each, each section preceded by a preface addressing the Christian reader and user. Its intended audience encompassed students and teachers of medicine and, expressly, the educated middle and upper classes. In structure, Part I of the *Höchst-nöthige Erkenntnis* was in the heterogeneous but still recognizable tradition of the Institutes of Medicine.[17] It consisted of a six-hundred-page section on anatomy, nonmorbid physiology (and its interface with disease), pathology, and instructions on lifestyle and dietetics—all heavily influenced by the subordination of health and physical function and dysfunction to the active agency of the soul. The remainder of the volume was dedicated to diseases, their causes, therapies, and outcomes, and to an appendix on prenatal, maternal, and infant care.

In terms of medical philosophy, Part I reflected much transitional and syncretic thinking of the period and was influenced by the author's mentors. Stahlian principles of the animus or soul as the sole and direct mover and controller of bodily and mental functions were joined to Hoffmann's anatomy of the nervous system, although the Stahlian system was emphasized. In view of the author's close connections with and support by a religious institution, Hoffmann's Cartesian paradigm—but not, it should be noted, his therapeutic approach—received less obvious support. Overall, however, the medical framework remained embedded in classic and early modern concepts and terminology. In particular, the classic and continuously resurrected Hippocratic principle of the body's ability to heal itself was stressed as the first requirement for care and cure.

The first part of Richter's treatise has been regarded by many historians, most notably Johanna Geyer-Kordesch, as a major example of the pervasiveness of Stahlian thought in Pietist medicine.[18] The second part, however, has received scant attention. It not only departs from the standard academic text but in several respects breaks new ground in pharmacotherapy—despite the fact that its author linked the rationale of reform to the commercial objectives of a philanthropic enterprise. The framework was entirely tied to the therapeutic and academic practice of the period, however, and bears

little if any resemblance to John Wesley's *Primitive Physic* (1772), which embraced a very different medical perspective.[19]

A full analysis of the therapeutic arguments offered in the Richter text would require a wider and more comparative framework than is appropriate in this article. Even a summary, however, suggests the flavor of developments and issues in eighteenth-century pharmaceutical therapy, in particular the reform of the materia medica.

Much of the introduction addressing the lay reader is dedicated to a closely reasoned discourse on the current state of the materia medica, closely following Stahl, Hoffmann, and others in their attempt to reduce polypharmacy, set reasonable standards of product safety, and reduce the use of complex composita. While we know relatively little of Stahl's pharmaceutical practice, a recent and detailed study of the pharmaceutical preferences of Hoffmann, derived in particular from his *Medicina Consultatoria* (1721–1723), affords a benchmark and the opportunity to assess Richter's premises in a larger perspective.[20] Richter, like his mentors, pilloried the pervasive redundancy of most composita and the resultant inability to nail down the efficacious component; he deplored the general lack of reliability, safety from side effects, and effectiveness of most pharmaceuticals, whether simples or composita. The major thrust was directed against the vast Galenic armamentarium and its multiple accretions during its various retransmissions into the European materia medica, but Richter fell short of giving full support to the chemiatric tradition. As a result, he relegated traditional materia medica from both the Galenic and chemical armamentarium—e.g., the *alexipharmacae*—to one brief and late chapter that provided recipes "which in common diseases can also be used with good effect. They too are formulated in such a manner that the body will not thereby become unduly agitated, as is the case with many so-called domestic remedies."[21]

Instead, he presented extensive discussion of the development, clinical indications, and therapeutic use of the Halle Orphanage medications. The benefits of those products were extolled, in particular for their safety as tested in the clinical settings of the orphanage and their purity and lack of adulteration because of close quality control during manufacture. Those advantages, he said, justified their treatment as aracana or trade secrets, the earlier but still persistent tradition in which the profit of trading on one's academic or clinical reputation by a proprietary medication was protected.[22]

Even given the lingering pervasiveness of arcana, carrying the argument of effectiveness absent full disclosure of ingredients demanded a deft sense of balance. Richter and his editors maintained that balance by linking the social usefulness, the charitable purpose, and the recognized rectitude of the foundations to their own medical expertise and academic credentials. Their conscious marshaling of current medical issues in the development of the final set of medications chosen for their physic chest was evident throughout. Each remedy was discussed in considerable detail as to its intended effects for specific morbid conditions, providing a coherent account of therapeutic intentions.

The Halle physicians were motivated by the lack of effective medicines, particularly during epidemics. (The German term used throughout the text is *kräftig*, which is insufficiently rendered as *strong* or *potent.*

In this article, the term *effectiveness* is used as most closely approximating Richter's intent, although it is devoid of the physiological and methodological implications of modern usage.) Richter's practice included the care of patients at the hospital of the Halle Orphanage Foundations, which in its early years admitted some of the city's poor as well as the orphans and students residing at the foundations. In a large and fairly constant clinical setting, Richter and his associates had examined all classes of simples and composita in the attempt to obtain a small and safe armamentarium with predictable and reasonably specific effects. Despite Richter's awareness of nature's self-healing processes and a nod to Hippocratic principles, he rarely questioned the traditional linkage of specific symptom relief and cure, obtained largely through the mechanisms of purging, excreting, and otherwise eliminating noxious substances and cleansing the blood while fortifying the body with additional medications. That did not vitiate his clinical method of selection, however, nor the elimination of therapeutic substances based on observation in large patient settings.

For the purposes of developing the Halle medicine chest, Richter and his associates accumulated an armamentarium of thirty medications. The remedies were selected as a result of product administration, patient observation, and subsequent elimination and substitution of individual items. Eleven were eventually selected for the chest. The advantages of the new assortment were said to be particularly noticeable for fevers and gonorrhea, white flux, *lues venerae,* consumption, and old running sores. Contents were graded in type and quantity, and the amounts in each chest, regardless of price, were proportionate to the expected frequency of use. Omitted medications, while not available as part of the medicine chests, were sold separately until the end of century. The Table on pages 11–12 matches Richter's clinical indications with historian Hans-Joachim Poeckern's transcription of the Halle formulae.[23]

Doses were prescribed and, in many cases, carefully distinguished by patient age. Not only effectiveness but safety of administration in the absence of a physician were considered important. For instance, *Essentia Antihypochondriaca* was found to contain all properties adhering to *Elixir Polychrestum* but to be safer in use, less obnoxious in taste, and requiring less care in administration and dosage. An early antifebrile essence required judicious application in cases where the fever did not tolerate hot remedies and was considered unsafe for a physic chest. Another exchange was made in the case of *Pulvis Laxans,* which had encountered problems of compliance in the case of distant patients or isolated providers and was replaced by *Pilulae Purgantes,* which acted as both a purge and a sudorific.

The star of the set was *Essentia dulcis,* a general tonic and strengthener advised a wide range of conditions, apparently including female complaints. Its description in the manual ran nearly fifteen pages, and it was obviously considered the biggest potential moneymaker. Despite its initial success, however, the effects of *Essentia dulcis* proved difficult to reproduce reliably, probably because frequent administration was needed, which in turn required substantial amounts of gold for large-scale preparation. *Essentia dulcis* was used continuously in the charity practice of the orphanage, however, and seems to have drawn in enough support to permit the

Composition and Clinical Uses of Standard and Additional Halle Orphanage Medications

Medications in Standard Chest	Composition	Clinical Uses
Essentia dulcis ordinaria Sweet essence ordinary	Tincture of gold *(aurum potabile).* Effective ingredient is a subtly purple-hued gold dissolved in *spiritus vini. E. dulcis* further distilled and concentrated in order to reduce *sp. Vini* content to obtain *E. dulcis concentrata.* Less concentrated preparations available as ointment *(E. dulcis extenuata* and *E. dulcis ad oculos).*	Arcanum and tonic, especially for nerves. Fortifier and strengthener, beneficial to nervous system, increases vital spirits. Anodyne (but contains no opium), antispasmodic, induces sleep. Wound balsam, used in women's illnesses, epilepsy, other seizures, labor, palsies (where external application is suggested), arthritis, gout. Reduces premature fetal activity in last 6 weeks of gestation, used in complications during and after delivery.
Essentia Amara Bitter Essence	Extract or tincture of bitter herbs	Antiscorbutic and blood purifier. Used to adjust or correct humors alone or in combination with *Pil. Polychr.* once or twice weekly. For running sores and ulcers, French pox, apoplexy, upset stomach, fevers, rheum, cough.
Essentia Anti-hypochondriaca Spleen-opening Essence	Resin of jalap, extract of black hellebore and aloe, dissolved in *spiritu frumenti* and *spiritus vitrioli*	For agues, quartan fevers, plague, burning or malignant fevers. Anthelmintic. Chief use in hypochondriac diseases in either sex, also melancholy, fury of the womb, hysteric passions, palpitations, madness.
Balsamus Cephalicus Balsam for the Head	Balsam of Peru, camphor, beef suet, and distilled herbal oils[1]	For external and occasionally internal use for diseases of head, toothache, apoplexy, palsy, swellings, and wounds. Applied to head, stomach, and limbs to strengthen nerves and other parts or to dissolve obstructing humors.
Pilulae contra Obstructiones Pills against Obstructions	Panchimagogum extract, containing colocynth, agaric, scammony, black hellebore, soccotrine aloe, and filings of steel	Cathartic for excessive costiveness, when obstructions cause headaches, giddiness, tinnitus, flatulence, vomiting, shortness of breath. More effective than purges; sometimes used with glysters (enemas).
Pilulae Polychrestae[2] Pills of Many Virtues	Extracts of scurvy grass, lesser centauri, fumitory, black hellebore, gentian, aloe, myrrh, common ivy, resin of juniper, pistacia, Scotch pine	Cathartic, mainly for females. Used to purify the blood, head, and stomach; open the spleen, evacuate noxious matter. May be given with *E. Amara* or *Pulvis Antispasm.* for anxiety, vomiting, looseness of the belly, bloody flux, edema, jaundice, reduced or excessive menstruation, against miscarriage and during labor. Counterindications: Painful hemorrhoids, blood in urine, chronic menstrual problems.
Pilulae Purgantes Purging Pills	Slightly different herbal composition from those in *Pil. contra Obstructiones* and omitting the filings of steel	Cathartic dissolving gastric mucus. Replaces *Pulvis Laxans.*
Pulvis Anti-spasmodicus Antispasmodic Powder	Arcanum similar to *Pulvis Bezoardicus*, with Glauber's Salt added[3]	Anodyne, cathartic. Strengthens stomach, corrects abnormal bile, relaxes spasmodic contractions, dissolves viscous humors, and coagulated blood after falls. Used in diarrhea, vomiting, blood spitting, stone problems, excessive menses, diarrhea and vomiting, hemorrhage, chest pains, shortness of breath, palpitations, gout.
Pulvis Bezoardicus Bezoard Powder	Varying mineral compositions of potassium sulfate, potassium nitrate, and cinnabar or red mercury sulfide. Earlier contained *antimonium diaphoreticum* and *cinnabaris nativa.*[4]	Antidote against poisons. Diuretic and diaphoretic; promotes sweating without perturbing the blood. Used in arthritic inflammations, upper respiratory illness, and to evacuate abnormal bile.
Pulvis contra Acredinem Powder against Acrimony	Powdered oyster shells with red currant juice	Absorbs and neutralizes acrimony. Gentle diaphoretic and diuretic. Used in febrile diseases, stomach complaints, diarrhea, urinary difficulty, and such skin eruptions as measles, smallpox, and purple fevers *(purpura).*
Pulvis Vitalis Fortifying Powder	Admixture of powdered oyster shells and four recipes, including *M. Diaphoreticum, Sulphur Veneris et Martis,* and *Materia Grisea.* May have contained magnesium sulfate and a silver oxide.	Arcanum. Gentle sudorific, tonic, and antiscorbutic. Used in fevers, diarrhea, red and white fluxes to quiet cramps and promote excretion. Also for putrid sores, boils, and fistulae. Claimed to be a very different tonic from other medications. Safe and reliable also in upper respiratory diseases and skin diseases in children.

Composition and Clinical Uses of Standard and Additional Halle Orphanage Medications, *cont.*

Additional Medications	Composition	Clinical Uses
Balsamus Mineralis Mineral Balm	By-product of *E. dulcis*, dissolved in *spiritus vini rectificatissimus*	Mild diaphoretic anodyne. Used in fevers, consumption, and wounds.
Electuarium Antiphthisicum Electurary for Chest, Lungs	Powdered herbs and flowers of liverwort, sage, rue, common nettle, garden hyssop, mint, and clarified honey	Strengthens and heals lungs by promoting expectoration. Used in hoarseness and dry cough.
Elixir Polychrestum	Panchimagogum extract, containing colocynth pulp, agaric, scammony, black hellebore, juice of aloe, and *mixtura simplex*	Strong laxative. Indications similar to *Pulvis Polychr.* Given with forced liquids and discontinued when stools appear.
Magisterium Diaphoreticum Sweat-inducing Powder	By 1740, precipitate of red iron oxides, chiefly ferric oxide mixed with silver chloride. Earlier mixtures still contained antimony oxide.	Mildly diaphoretic without causing weakness. Used in such skin diseases as eczema and syphilis, where it should be used together with *E. Amara* and *E. dulcis*. Also for diarrhea, earaches, toothaches, and fevers with chills.
Pulvis Laxans Laxative Powder	Made of calomel (mercury chloride), scammony, and powdered oyster shells	Cathartic and anthelmintic. Dissolves mucus and purifies blood. Used in diseases of the skin and venereal disease. Not to be used more than twice per illness.
Pulvis Niger Black Powder	By-product of making *E. dulcis*	Tonic. Used first in cases of pediatric consumption and bloody fluxes. To be used in very small doses in patients who do not respond to other medications or in cases of very sudden and dangerous symptoms.
Pulvis Polychrestus	Early medication made of *ens veneris, sulphur auratum antimonii*, copper sulfate, and powdered oyster shells (See *Pil. Polychr.).* Replaced in chest by *E. Antihypochondriaca.*	Emetic, expectorant. Used in all fevers except those beginning with diarrhea, cough, congestion of the chest, smallpox, or measles.
Pulvis Solaris Golden Powder	Like *Pulvis Vitalis* but without *Materia Grisea*	Like *Pulvis Vitalis*
Pulvis Stomachicus Stomach Powder	Cinnabar and potassium sulfate	For gastric complaints and fevers
Pulvis Uterinus Griseus or *Nigricans* Gray or Black Powder	The gray powder was composed of niter or potassium nitrate and *Materia Grisea* (fixed or carbonized camphor) and powdered oyster shells; in the black powder, the camphor was carbonized by sulfuric acid	Not specified but generally used as refrigerant, diuretic, antiseptic, diaphoretic, and mild cathartic, for female fevers or other complaints
Tinctura Corallina[5] Coral Tincture	Juice of lemons mixed with ammonium carbonate to produce ammonium citrate. *Spiritus frumenti* added.	Not specified, but probably used as absorbent for gastric complaints or as astringent
Tinctura Salina Saline Tincture	Potash, root of gentian, and unripened oranges	Not specified, but generally used as cooling diaphoretic and gastric sedative

SOURCES: Christian Friedrich Richter, *Die Höchst-nöthige Erkenntnis* . . . (Leipzig, 1715) and later editions; Hans-Joachim Poeckern, *Die Halleschen Waisen- hausartzeneyen* (Leipzig: Edition Leipzig, Bibliotheca Historico-naturalis Antiqua, 1984), vol. 1; manuscript formularies, Wirtschafts-und Verwaltungsarchiv, Franckesche Stiftungen, Halle.

1. Apparently similar to an arcanum of Hoffmann's; see Almut Lanz, *Arzneimittel in der Therapie Friedrich Hoffmanns* . . . (Braunschweig: Deutscher Apotheker-Verl., 1995), 188.
2. Often a chemiatric remedy containing potassium sulfate or magnesium carbonate (J. Worth Estes, *Dictionary of Protopharmacology* [Canton, Mass: Science History Publications, 1990]), but in the Richter composition similar to an adaptation of the so-called Becher Pills used as an arcanum by Stahl and Hoffmann (Lanz, *Arzneimittel*, 200).
3. According to Lanz (*Arzneimittel*, 200), containing *nitrum depuratum, tartarus vitirolatus*, and cinnabar or mercury sulfate.
4. Richter considered his composition superior to traditional oriental and occidental bezoars.
5. Under a similar name, a preparation of Coral (Estes, *Dictionary*; Lanz, *Arzneimittel*, 189).

eventual manufacture of larger amounts and distribution among most patients in need. The large number of treated cases seemed also the clinical basis on which to claim benefit in many patients.[24]

The development of *Essentia dulcis* led to two more medications by 1703, when a strengthening tonic was needed for three orphanage children devastated by consumption. As a by-product of *Essentia dulcis*, the physicians produced *Balsamus Mineralis* and *Pulvis Niger* (Black Powder). The latter was administered to a child in a dose of as little as one grain and was reported not only to have restored the child's strength but to have improved the effect of other medications. A final addition to the Halle armamentarium was *Pulvis Vitalis*, found to be far superior to other medications in *affectionibus lymphae* and in most fevers. *Pulvis Vitalis*, however, was difficult to manufacture; as one of the more expensive items in the physic chest, it was counseled only as a last resort. It nonetheless proved to be a mainstay of both Russian orders at the beginning of the century and of North American orders until 1800; it was recommended and apparently used in small doses for lying-in women.[25] Apparently, users appreciated the unit sizes for some of the medications, which were as small as a quentchen (approximately four grams, or a half-drachm) for such powders as *Pulvis Vitalis* and *Pulvis Stomachicus*.

Opposition to the Halle medicines came from other physicians and from theologians. The latter objections Richter attributed, with justification, to the Pietist nature of the Francke Foundations. Physician objections centered on a number of issues, competition being an underlying and occasionally overt motive. Above all, medical and religious orthodoxy raised objections to the linkage between chemiatrics and Paracelsian mysticism, a charge routinely levied against the medical reform proposals of dissenting elements.[26] While the *Höchst-nöthige Erkenntnis* refrained entirely from astral or sidereal medicine, its signatures, or any of the other of the early modern paraphernalia of Paracelsian or hermetic texts, the author did attribute the first breakthrough to the bequest of chemiatric manuscripts. *Essentia dulcis*, in particular, was attacked by famous chemical distillers on the grounds that gold could not provide a distillate.[27]

But neither professional nor orthodox Lutheran animosity could prevent success. There was a constant increase in trade, and from roughly 1740 to 1765, net profits yielded an annual average of twenty-five thousand to thirty thousand Reichsthaler, or roughly £6,000.[28] During the early part of the century, the Russian trade alone ran to roughly six thousand rubles in gold, or £1,000, per year.[29]

Numerous physicians testified to the safety and usefulness of the products. Above all, with the possible exception of the claims for *Essentia dulcis*, Richter and his associates argued that they had been careful to maintain a medically conservative attitude that would not run counter to the criteria of medical and pharmaceutical reform. They never extolled the superiority of their products to the exclusion of all others, and they offered a number of caveats and disclaimers, above all rejecting the charge that they had claimed a miraculous cure. Instead, their own clinical observations indicated cures and relief in serious as well as nonresponding diseases. Conversely, where they lacked success, there was no evidence that other remedies in fact worked. Nor had it been possible to show that the orphanage medications

caused harm, while it was all too well known that ordinary medications—and often the physicians themselves—harmed the health of many. Ill effects were ascribed to excessive doses and patient error in cases of self-medication.[30] Likewise—although that argument was rather spurious in view of the ongoing European trade—the Richters claimed that there was no intent to compete with local practice; it had been a condition of the royal and other privileges to the foundations that sales outside of licensed pharmacies would be restricted to locations where no physicians and pharmacists were available.

Traditional issues of secrecy and the refusal to publish the formularies were grounded in the very issues of pharmaceutical reform.[31] Refusal to reveal the recipes was intended to protect patients from going directly to pharmacists or others for preparation, risking adulteration and abuse. For the honest physician who wished to use the medications because of their superior strength and potency, lack of knowledge of the composition and *modus praeparationis* was no obstacle, Richter argued, since physicians rarely prepared their own medications and instead relied on apothecaries. Likewise, although physicians might insist on knowledge of ingredients for reasons of rational and safe therapy, the known usefulness of the Halle medications over the course of several years was sufficient reassurance.

And with the rhetorical skill that at the beginning of the eighteenth century still was a virtue rather than a vice in academic discourse, the Richters claimed that yielding the monopoly of preparation and packaging would contravene the very purpose of the original bequests and the investment of time and financial resources. If well-off people were to be given access to having the medications prepared for themselves, there would be no margin of profit to be diverted to charity. And charity had to become more firmly grounded and self-sufficient in an age where people quickly tired of appeals to their purse.[32]

The Traffic in Halle Orphanage Medicines

The success and duration of the European and international pharmaceutical traffic of Hallesche Medikamenten-Expedition was attributable to both pharmaceutical rationale and charitable appeal. Between 1700 and 1720, the foundations slowly developed a network of commercial and clerical buyers and distributors,[33] with smaller orders going directly to individual nobility in Germany and the Protestant areas of eastern and southeastern Europe and the Protestant cadres at the Russian court. The Russian trade during the final decade of the reign of Peter I relied heavily on previously established medical and diplomatic connections. The trade was surprising in scope, going through the Baltic regions to trusted associates in Moscow and by commercial vessels into Archangelsk.[34]

When August Hermann Francke died in 1727, there was a period of relative instability but continuous growth as the heirs of the Richter brothers and Gotthilf August Francke, son of the founder, fought among themselves for control.[35] With the eventual assumption of control by Madai, a long period of extraordinary and sustained growth occurred that terminated only with his death in 1780. That growth, however, was not won without battle.

The obstacles to the spread and stability of the Orphanage medications commerce were both endogenous to the trade in pharmaceuticals and reflected larger

secular trends. From the outset, local, regional, and national tariff and other trading restrictions had to be overcome again and again by petitions and the use of the network of former Halle pupils and associates in the nobility and the administration. There was the continuing if largely unsuccessful attempt by the various medical and hygiene establishments to gain control over pharmaceutical manufacture through restriction and visitations.[36] Confessional and dynastic barriers continued to be of importance in the German territories until the Napoleonic period. In Catholic Saxony and the Austrian territories, where the Protestant areas around Pressburg and in Siebenbürgen were major markets and army physic chests in some of the Italian campaigns were stocked with Halle medications,[37] trade continued to be vulnerable to dynastic preferences but also was favored by special exemptions.[38] The same was true for the newly Russian areas of the Baltic as well as Prussian Königsberg. The Imperial Cities plowed their own furrow of market and trading rules, and there as well as in Holland, the colonial trading interest seemed to have won out despite increasing political obstacles.[39]

The most important commercial threats were falsification, quackery (*Pfuscherei*), and unauthorized sale, all of which took up much of the administrator's time. It appears that the popularity of the medications and a loyal market made them an easy target for imitations both in Europe and abroad. In part, that was due to the continued insistence in Halle to favor its own distributors among clergy, friends, and trusted traders over distribution by apothecaries, who were suspected of imitation and charged with substitution of their own substances and whose inferior products were said to threaten the reputation of the Halle medications.[40] But there also was falsification and downright piracy on an international scale.

Among numerous cases of the substitution of seals and goods (including the imposition en route of faked seals), a major case in the 1760s throws some light on the heavy and contested colonial trade. A Dutch trader named Dreissiger, in collusion with a merchant from Halle, reprinted the Dutch version of the Madai treatise in Amsterdam, and sent the pirated edition from Holland to the "East and West Indies" together with a three-thousand-Thaler shipment of imitations of the Halle medications. Dreissiger had provided the reprint to hide the name of the Halle agent in Amsterdam, which was prominently displayed in the original Dutch text. Madai discovered the swindle when an Amsterdam merchant named Petri sent him copies of invoices and bills of lading sent by customers in the tropics who had learned of the swindle and returned the merchandise unpaid.[41]

In Europe, the medical and institutional threat came from the growth of medical regulation under enlightened absolutism, beginning with Prussia in 1725, which offered apothecaries protection against irregular competition and to the bureaucracy a tool of regulation. The almost unquestioning admiration of the Halle institutions by Frederick William I yielded to a more critical attitude under his son, Frederick II; nevertheless, Halle based its argument for continued protection of trade privileges on tariffs and postal revenues accruing to the Prussian coffers and the effect on the local economy of the Halle foundations as a major employer.[42] The aversion of Frederick II to the Pietist

Francke Foundations seemed not to have affected the pharmaceutical trade, the peak period of which coincided with the two decades of wars between Prussia and Austria over Silesia.

But by the end of the Seven Years' War (1756–1763), the network of Pietist nobility and merchants tied to the Francke Foundations by personal loyalty and memory had been thinned. Profits fell from thirty-four thousand Reichsthaler in 1765 to roughly seven thousand Reichsthaler in 1799, and the ledgers indicate a decidedly smaller group of merchants placing orders for large amounts. By the end of the century, the medical standing of the Halle pharmaceuticals had been eroded by the advance of the very reforms advocated by the Richter brothers in 1708. Public health regulations had relegated arcana and nonreproducible substances to the field of patent medicines, even when recipes came from respected physicians.[43]

In 1790, after almost one hundred years of constant and profitable trading with Halle, the new Dutch *ministre de la santé publique et de l'éducation nationale* was barred by revolutionary statute from continuing the Halle trading privilege. Trade continued only by virtue of a secret license extended to the Halle commissary, Welling, based on personal intercession by the King of Prussia and, no doubt, the transatlantic trading community.[44] In 1804, at the height of the British continental blockade against Napoleonic Europe, the then head of the Medikamenten-Expedition, August Carl von Madai, summarized the drastic decrease in pharmaceutical profits and thus in monies accruing to the Francke Foundations as follows:

> In the current wars, almost all seaports are under blockade and . . . our medications are almost everywhere barred from sale. This has had a most deleterious impact on our trade. In addition, prices [of raw materials] have risen and there is a dearth of cash. These and the new therapies [emphasis added] contribute to the decrease in demand for our medications, while costs have risen constantly.[45]

But the final act of regulation came from close to home, in the wake of a new wave of Prussian administrative reforms instituted in 1706. In an 1812 letter over the signature of Frederick William IV of Prussia, continued exemption from pharmaceutical regulations and the maintenance of their own agents in Brandenburg and Prussia were denied to the Halle foundations as contrary to statute and unwarranted in view of the large number of local pharmacies capable of undertaking the sales of the famous medications.[46]

The North American Trade

The first signs of decline in Europe had set in during the late 1760s and accelerated into the nineteenth century as the result of health reforms and changes in commerce, But trade to the new American Republic saw a steady if modest resurgence during the 1790s and remained constant until beyond the turn of the century. It was carried by a remaining loyal group of clerical providers and merchants dealing through Holland and Hamburg.

The transatlantic traffic in medicines and medical practice, as is argued elsewhere in this issue, eventually contributed to the medical culture of North American German-language settlements over the period 1735–1820. That period, which spanned the last decades of

colonial British rule and the commercially vibrant and risk-prone early Republican period, saw the growth of a large, diverse, and often aggressive American medical market in which numerous male and female providers of different educational and national backgrounds advertised their services and sought their clientele among a public that split its use of limited personal resources between a reliance on self-help and the traffic in European medicines.[47] In the German communities from Georgia to New York, a group of medical providers evolved who in probably equal parts consisted of clergy trained at the Pietist motherhouse in Halle, medical men and some women of various levels and types of training, German midwives, and clergy of other denominations practicing medicine. Many if not all found mutual support in the evangelical interpersonal network of the Francke Foundations in Halle and their traffic in medicine and medical ideas.

During most of that period, the Pietist clergy and subsequently a younger American-born generation—some trained in Germany—engaged both in charity and fee practice, following the European colonial missionary tradition of joining medicine and religion,[48] a phenomenon also observed for English ministers in North America.[49]

German Pietist ministers who had been trained in clinical practice by Pietist physicians associated with the Friedrich University in Halle could rely on access to the proprietary medications produced by their motherhouse.[50] Until 1776, they also benefited from customs exemptions granted to shipments from their motherhouse as gifts of charity.[51] But they and their associates learned to supplement reliance on European products by American resources. When trade with Halle was interrupted because of a lack of credit or because of war and revolution (1756–1773, 1776–1783), some clergy attempted to reproduce the Halle medications, using available materia medica and plant substances. Commercial imitations were made, used, and advertised as well.[52]

The market was influenced by differences in regional structure, demographic characteristics, and social stratification of the settlers, disease environment, and financial support through the Halle establishment. The Salzburger settlement of Georgia—the flagship settlement of the Pietist missions in North America that was founded in 1733 under the joint auspices of the Georgia Trustees, the Anglican Society for Promoting Christian Knowledge, and the German Pietist movement—relied on free services by medical personnel assigned to their settlement, on an uninterrupted supply of medications, and on diagnostic advice offered in the correspondence with their European sponsors.[53]

Prior to 1776, both the Salzburger settlement and a small group of local German planters with varied interests in the natural sciences flourished, only to be subsumed by the destruction wrought by the Revolutionary War and the neighboring and more explicitly professional Charleston medical establishment. But as late as 1802, the accumulated interest from several substantial bequests by German Pietist donors was used to finance shipments of medications from Halle. Particularly among women clients, those included medical texts, indicating product loyalty, brand recognition, and the persistence of German reading skills among descendants of the first settlers.[54]

In the middle colonies and in some Moravian communities of South Carolina, physicians serving German patients relied on Halle medical ideas and practice by purchasing the Richter text and the medications. By the 1750s, German merchants in the middle colonies and many among the educated classes ordered supplies for their customers and their families through the trading channels of the Halle Orphanage. The hope of tapping into a lucrative market is suggested by commercial support of attempts to enter into the trade by Lancaster and Philadelphia clergy and by a Mühlenberg son. Among the most prominent backers was Heinrich Keppele, a major German merchant and the eventual father-in-law of a leading Halle cleric in Pennsylvania, Heinrich Justus Helmuth.[55]

Because Halle medications were finished products, it is difficult to assign relative orders of magnitude to those imports. Very different amounts and types of medications were ordered from the standard lists by different types of customers. One Halle clergyman who had emigrated in the late 1740s was interested in large-scale distribution and ordered far larger amounts in larger individual quantities than, for example, did Anna Maria Mühlenberg. She in turn ordered numerous separate items in small quantities (drachmas or quarter ounces), and her orders included mainly strengtheners (*Essentia dulcis* and *Pulvis Vitalis*) and laxatives. As noted by ner son Gotthilf Heinrich Ernst Mühlenberg in a diary entry, the small unit size provided by Halle was a considerable advantage in lay medical practice that excluded the practicing apothecary as middleman.[56] The most professional and persistent of the practicing clergy from Halle, he received standing orders throughout the 1790s and beyond that included more or less the entire offering of medications detailed in the Richter text at the beginning of the century.[57]

The merchants in such German communities as Lancaster became more rather than less cautious over time; in 1799, they ordered relatively small quantities since they did not have direct patient access nor did they run apothecary shops. We do not know if they carried the large supplies of simples and spices customary for many English merchants of the region and period. Rarely did the famous *Essentia dulcis* rank first in American orders, although it remained a substantial part. Also, the medicine chests do not seem to have popular. Most orders, whether by laymen or the clergy, were for individual medications in varying amounts. Those findings, however, are limited to documented orders by the Halle clergy.

It is equally difficult to judge the volume of the Halle Orphanage medications in relation to the total drug market in the colonies, whatever its origin and nature. Although there were numerous sources of supply outside the direct route through Halle clergy (such as immigrant ships from Rotterdam during the period prior to 1776[58]), the scope of the trade is difficult to determine without further work on both German and foreign pharmaceutical imports.

♦

Notes

1. Renate Wilson, "Pietist Universal Reform and Care of the Sick and the Poor: The Medical Institutions of the Francke Foundations and Their Social Context," in *Institutions of Confinement:*

Hospitals, Asylums, and Prisons in Western Europe and North America, 1500–1950, ed. Norbert Finzsch and Robert Jütte (Cambridge: Cambridge University Press, 1996), 133–54.

2. Ronald L. Numbers and Darrel W. Amundsen,eds., *Caring and Curing: Health and Medicine in the Western Religious Traditions* (New York: Macmillan, 1986), 173–203. For the eighteenth century, see Colin Jones, *Charity and Bienfaisance: The Treatment of the Poor in the Montpellier Region, 1740–1815* (Cambridge: Cambridge University Press, 1982), and Mary E. Fissell, "Charity Universal? Institutions and Moral Reform in Eighteenth-century Bristol," in *Stilling the Grumbling Hive: The Response to Social and Economic Problems in England, 1689–1750,* ed. Lee Davison et al. (Stroud, England: Alan Sutton, 1992), 121–44.

3. Patricia A. Watson, *The Angelical Conjunction: The Preacher-Physicians of Colonial New England* (Knoxville: University of Tennessee Press, 1991); Renate Wilson, "Die Halleschen Waisenhausmedikamente und die 'Höchst-nöthige Erkenntnis' im Kolonialstaat Georgien, 1733–1765," *Schriftenreihe für Technik, Naturwissenschaften und Medizin* 28 (1991): 109–28; Norman Gevitz and Micaela Sullivan-Fowler, "Making Sense of Therapeutics in Seventeenth-Century New England," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 11, no. 2 (1995): 87–102; John Duffy, *The Healers: The Rise of the Medical Establishment* (New York: McGraw-Hill, 1976).

4. Francisco Guerra, "Drugs from the Indies and the Political Economy of the Sixteenth Century," *Analecta Medico Historica* 1 (1966): 29–54; David L. Cowen, "The Impact of the Materia Medica of the North American Indians on Professional Practice" in *Botanical Drugs of the Americas in the Old and New Worlds,* ed. W. H. Hein (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1984); J. Worth Estes, "The European Reception of the First Drugs from the New World," *Pharmacy in History* 37 (1995): 3–23; Clifford M. Foust, *Rhubarb: The Wondrous Drug* (Princeton, N.J.: Princeton University Press, 1992), 199.

5. Roy Porter and Dorothy Porter, "The Rise of the English Drugs Industry: The Role of Thomas Corbyn," *Medical History* 33 (1989): 277–95; Ian Kenneth Steele, *Atlantic Merchant-Apothecary: Letters of Joseph Cruttenden, 1710–1717* (Toronto and Buffalo: University of Toronto Press, 1977); Cowen, "Impact of the Materia Medica"; J. Worth Estes, "Patterns of Drug Usage in Colonial America," *New York State Journal of Medicine* 84, no. 1 (1984): 37–45.

6. Wilson, "Pietist Universal Reform."

7. Berthold Beyerlein, *Die Entwicklung der Pharmazie zur Hochschuldisziplin (1750–1875): Ein Beitrag zur Universitäts- und Sozialgeschichte* (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1991), 72.

8. One of the testators was Superintendent Fischer, a major Lutheran figure in the Baltic areas whose family had close Pietist connections since the 1680s; see Johannes Wallmann, "Beziehungen des frühen Pietismus zum Baltikum und zu Finnland," in *Der Pietismus in seiner europäischen und aussereuropäischen Ausstrahlung: Suomenkieliset tiivistelmat,* ed. Wallmann and P. Laasonen (Helsinki: Suomen Kirkkohistoriallinen Seura, 1992). The report on Fischer's communication of recipes is in IX/ii/16 fol. 185–94, and Samuel David von Madai, letter, May 28, 1742, Wirtschafts-und Verwaltungsarchiv der Franckeschen Stiftungen, Halle (hereafter cited as VAFSt).

9. Wilson, "Halleschen Waisenhausmedikamente," Table 2; Eckhard Altmann, *Christian Friedrich Richter (1676–1711): Arzt, Apotheker und Liederdichter der Halleschen Pietisten* (Witten: Luther Verlag, 1972); Hans-Joachim Poeckern, *Die Halleschen Waisenhausartzeneyen,* 3 vols. (Leipzig: Edition Leipzig, Bibliotheca Historico-naturalis Antiqua, 1984), vol. 1 (all citations hereafter are to that volume).

10. Poeckern, *Halleschen Waisenhausartzeneyen.*

11. Werner Piechocki, "Gesundheitsfürsorge und Krankenpflege in den Franckeschen Stiftungen in Halle/Saale," *Acta Historica Leopoldina* 2 (1965): 29–66; Wilson, "Pietist Universal Reform."

12. Eduard Winter, *Halle als Ausgangspunkt der deutschen Russlandkunde im 18. Jahrhundert* (Berlin: Akademie-Verlag, 1953); Arno Lehmann, *Hallesche Mediziner und Medizinen am Anfang deutsch-indischer Beziehungen* (Halle: Verlag des Waisenhauses, 1956); Wilson, "Halleschen Waisenhausmedikamente."

13. "Königlich preussisches und Churfürstlich Brandenburgisches allgemeines und neugeschärfts Medicinal Edict und Verordnung,auf seiner königlich Maj. allergnädigsten Befehl herausgegeben von dero Obercollegio medico, mit ihrer

köngl. Maj. allergn. privilegio," Berlin, 1725, and addendum, Sept. 27, 1727, both in IX/ii/7, VAFSt; see also Beyerlein, *Entwicklung der Pharmazie.* For cameralist reform in an adjacent German territory, see Mary Lindemann, *Health and Healing in Eighteenth-Century Germany* (Baltimore: Johns Hopkins University Press, 1996), ch. 1.

14. This article uses the most extensive text, Christian Friedrich Richter, *Seeligen Hn. D. Christian Friedrich Richters Höchst-nöthige Erkenntnis des Menschen, sonderlich nach dem Leibe und natürlichen Leben, oder ein deutlicher Unterricht, von der Gesundheit und deren Erhaltung; auch von deren Ursachen, Kennzeichen und Namen der Krankheiten, damit ein jeder, auch ungelehrter bei Ermangelung eines Medici, sonderlich durch XI hierzu hinlänglich erfundene, und Gebrauch dieses Traktats, vermöge bisheriger reicher Erfahrung die gewöhnlichen, auch schweren Krankheiten sicher und mit gutem Success kurieren Könne, . . . und herausgegeben von D. Christian Sigismund Richter und D. Johann Wolfgang Künstlin, Med. Pract. in Halle* (Leipzig: Johann Friedrich Gleditsch und Sohn, 1712). The edition hereafter cited is from 1715, in a copy apparently purchased in Hungary and now at the Health Sciences Library, University of Wisconsin Medical School, Madison. I thank Curator of Rare Books Phyllis Kaufmann for her help with those and other sources. Altmann, *Christian Friedrich Richter,* provides a full listing of all editions.

15. Wolfram Kaiser, "Der Lehrkörper der Medizinischen Fakultät in der halleschen Amtszeit von Georg Ernst Stahl," in *Georg Ernst Stahl, 1659–1734,* ed. Kaiser and Arina Völker (Halle and Wittenberg: Martin-Luther Universität, 1985); David Samuel von Madai, *Abhandlung von den sogenannten kalten Fiebern* (Halle: Verlag des Waisenhauses, 1747).

16. David Samuel von Madai, *Kurtze Nachricht von dem Nutzen und Gebrauch einiger bewährten Medicamente: Welche zu Halle im Magdeburgischen in dem Waisenhaus dispensiret werden* (Halle: Waisenhaus, 1746). A Greek version bearing the autograph of J. Redman Coxe is at the College of Physicians, Philadelphia. See also Winter, *Halle als Ausgangspunkt,* and Lehmann, *Hallesche Medizïner.*

17. For the slow but pervasive changes in those texts in the teaching institutions of Italy and then Central Europe, see Jerome J. Bylebyl, "Teaching Methodus Medendi in the Renaissance," in *Galen's Method of Healing: Proceedings of the 1982 Galen Symposium,* ed. Fridolf Kudlien and Richard J. Durling (Leiden: E. J. Brill, 1991), 157–89 and, concerning Hoffmann and Boerhave, see Lester S. King, *The Road to Medical Enlightenment, 1650–1695* (London: Macdonald, 1970).

18. Johanna Geyer-Kordesch, "Georg Ernst Stahl's Radical Pietist Medicine and Its Influence on the German Enlightenment," in *The Medical Enlightenment of the Eighteenth Century,* ed. Andrew Cunningham and Roger French (Cambridge: Cambridge University Press, 1990), 67–87; Johanna Geyer-Kordesch, "Die Medizin im Spannungsfeld zwischen Aufklärung und Pietismus: Das unbequeme Werk Georg Ernst Stahls und dessen kulturelle Bedeutung," in *Zentren der Aufklärung, I, Halle: Aufklärung und Pietismus,* ed. Norbert Hinske (Heidelberg: Lambert Schneider, 1989), 255–73.

19. John Wesley, *Primitive Physick: or An Easy and Natural Method of Curing Most Diseases,* 15th ed. (London: Hawes, 1772); Henry Abelove, *The Evangelist of Desire: John Wesley and the Methodists* (Stanford, Calif.: Stanford University Press, 1990).

20. Hoffmann's practice, as was customary in the period, was comprised of local practice and of consultations with distant patients and their physicians. Almut Lanz, *Arzneimittel in der Therapie Friedrich Hoffmanns (1660–1742): Unter besonderer Berücksichtigung der Medicina Consultatoria (1721–1723)* (Braunschweig: Deutscher Apotheker-Verl., 1995).

21. Richter, *Höchst-nöthige Erkenntnis,* 565–66.

22. For Hoffmann's and Stahlian arcana, see Lanz, *Arzneimittel in der Therapie,* 170; for the persistence of the secreta tradition, see William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994).

23. Poeckern, *Halleschen Waisenhausartzeneyen.*

24. According to Item 19: "[T]hough we now had this remedy (die ess. dulcis), it would have been of little benefit if we had not quickly observed this one advantage that in many cases the strength of this medication lay in its repeated application, which could be as often as every half hour" (Richter, *Höchst-nöthige Erkenntnis,* 531). What the author and his successors omitted to mention was the extraordinary financial support required for *Essentia dulcis* and the bitter fight over rights of production, sales, and profits that ensued between them and August Hermann Francke and his successors over the course of the

entire century; see Poeckern, *Halleschen Waisenhausartzeneyen,* and Wilson, "Halleschen Waisenhausmedikamente."

25. E.g., by Anna Maria, nee Weiser, wife of Heinrich Melchior Mühlenberg, the best-known Halle missionary in North America. She ordered six hundred drachms of the preparation from Halle, according to documents in Series IV, Missionsarchiv of the Francke Foundations, Halle (hereafter cited as MAFSt). Tightly packed individual doses of concentrated medications seems to have been a distinguishing mark of Halle medications (breast tea and electuaries being exceptions); apart from therapeutic considerations, that added to their attractiveness for foreign shipment.

26. Charles Webster, *The Great Instauration: Science, Medicine and Reform, 1626–1660* (London: Duckworth, 1975); Jole Shackelford, "Rosicrucianism, Lutheran Orthodoxy, and the Rejection of Paracelsianism in Early Seventeeth-Century Denmark," *Bulletin of the History of Medicine* 70 (1996): 181–204.

27. Stahl also parted company with his student on the question of suspending gold in a tincture; see correspondence between Christian Sigismund and Christian Friedrich Richter and Hildebrand von Canstein, C 285, Hauptarchiv der Franckeschen Stiftungen, Halle. The process is fully described in the manufacturer's formulary in Poeckern, *Halleschen Waisenhausartzeneyen.* In rejecting the claims for *Essentia dulcis,* the issue was not one of alchemy (the production of a nobler from a more common metal) but a serious question of technical feasibility apart from medical efficacy. Nonetheless, the Richters felt the need to publish several testimonials, including Christian Friedrich Richter, *Ausführlicher Bericht von der Essentia Dulci* (Halle: Waisen-Haus, 1708).

28. The conversion rates are close approximations based on John J. McCusker, *Money and Exchange in Europe and North America, 1600–1775* (Chapel Hill: University of North Carolina Press, 1978).

29. The Russian trade is partly documented in IX/ii/296, VAFSt, for 1709–1717.

30. Richter, *Höchst-nöthige Erkenntnis,* 541.

31. Wolf-Dieter Müller-Jahncke, *Astrologisch-magische Theorie und Praxis in der Heilkunde der frühen Neuzeit* (Stuttgart: Steiner Verlag Wiesbaden, 1985); Beyerlein, *Entwicklung der Pharmazie,* chs. 1–2; Harold J. Cook, "Henry Stubbe and the Virtuosi-Physicians," in *The Medical Revolution of the Seventeenth Century,* ed. Roger K. French and Andrew Wear (Cambridge: Cambridge University Press, 1989), 256–65.

32. For the difficulties of appeals to charity, see David Owen, *English Philanthropy, 1660–1960* (Cambridge, Mass.: Harvard University Press, 1964).

33. "Externa des Medikamentenhandels von 1725–1799," IX/ii/22, 28, 30, 32, 33, 37, VAFSt.

34. Eduard Winter, *Halle als Ausgangspunkt*; Renate Wilson, *Heinrich Wilhelm Ludolf, August Hermann Francke und der Eingang nach Russland* (Halle: Verlag der Franckeschen Stiftungen, 1997).

35. See, in particular, IX/ii/16 fol. 185–194, VAFSt, and Poeckern, *Halleschen Waisenhausartzeneyen.*

36. Beyerlein, *Entwicklung der Pharmazie,* chs. 1, 2.

37. Draft of a letter to "*Imperatricem et reginam Hungariae,*" 1750, IX/ii/30, VAFSt.

38. "Acta den Medicamenten debit im chursächsischen betrf.," letter to Baron von Ende, with response regarding exemption by the King of Saxony, July 17, 1769, all in IX/ii/33, VAFSt.

39. For Frankfurt am Main, see "Acta des von dem Sanitäts Collegio der kayserlichen freyen Reichsstadt Frankfurt am Mayn gesuchte Verbot der hiesigen medicam. betr. 1761," IX/ii/32, VAFSt.

40. "Copeyen der in anno 1764 von hofr Madai an das collegium medicum zu Berlin eingesandten memoralien" [Aug. 14, 1764], IX/ii/22, VAFSt. Imitation of particular medications or even the Halle set was observed in British North America; see, for example, Kurt Aland, ed., *Die Korrespondenz Heinrich Melchior Mühlenbergs: Aus der Anfangszeit des Deutschen Luthertums in Nordamerika,* 4 vols. (Berlin: W. de Gruyter, 1986–1993), 1:412, 2:373–74, and an advertisement in the *Neue Unpartheyische Lancaster Zeitung und Anzeigsnachrichten,* Jan. 16, 1788.

41. The original Madai text was published by Gerrit Born in Amsterdam; see IX/ii/22, fol. 5 ff., VAFSt.

42. "Copeyen der in anno 1764." The letter refers both to the taxes paid for the simples used in drug preparation and to the employment of carpenters, locksmiths, leather toolers, bookbinders, and others for packaging and shipment.

43. Beyerlein, *Entwicklung der Pharmazie*; Glenn

Sonnedecker, ed., *Kremers and Urdang's History of Pharmacy,* 4th ed. (Philadelphia: J. D. Lippincott, 1976).

44. Letters by Frederick William III, July 10, 1799, and Jan Lodewig Gregory, at The Hague, IX/ii/37, VAFSt. Gregory stated that the medications were a special class of *allgemene Genesmittel,* or *arcana.* Also, Welling, who had been the Halle agent since 1793, argued: "[T]hese internal medicines from Halle do not fall under the new regulations . . . since the benefit and potency of the Halle Orphanage medications are well known both to members of the Commission and to the public in general, so that even men of known medical repute and experience do not hesitate to recommend them" (IX/ii/37, VAFSt).

45. IX/ii/(1)(n.p.), VAFSt.

46. July 12, 1812, letter, IX/ii/28, VAFSt.

47. Duffy, *The Healers.*

48. Implicit in both Catholic and Protestant practice was a specific foreign mission objective, which had clearly been superseded by the American Revolutionary War. The medical practice at Moravian Indian missions may be an exception, but it remains largely uninvestigated and lies outside the scope of this article. See Renate Wilson, "Continental Protestant Refugees and Their Protectors in German and London Commercial and Charitable Networks," *Pietismus und Neuzeit. Ein Jahrbuch zur Geschichte des neueren Protestantismus* 20 (1994): 107–24.

49. Watson, *Angelical Conjunction*; Gevitz and Sullivan Fowler, "Making Sense of Therapeutics."

50. Wilson, "Pietist Universal Reform."

51. Renate Wilson, "Public Works and Piety: The Missing Salzburger Diaries for 1744–1745," *Georgia Historical Quarterly* 77 (1993): 336–66; Wilson, "Halleschen Waisenhausmedikamente."

52. H. G. E. Mühlenberg Diary, M892, vol. 2, Heinrich Gotthilf Ernst Mühlenberg Papers, American Philosophical Society, Philadelphia (hereafter cited as Mühlenberg Diary); letters to Abraham Wagner, the so-called *Schwenkfelder Doktor,* and others in Aland, ed., *Korrespondenz,* 2:317, 373–76.

53. Wilson, "Halleschen Waisenhausmedikamente"; Renate Wilson and Hans-Joachim Poeckern, "A Continental System of Medical Care in Colonial Georgia," *Medizin, Gesellschaft und Geschichte: Jahrbuch des Instituts für Geschichte der Medizin der Robert Bosch Stiftung* 9 (1992): 99–126.

54. A fairly large shipment comprised of many small orders was sent in May 1802 in payment of accumulated interest on an old bequest made to support the Ebenezer settlement (V, B4:23, MAFSt). Men and women ordered separately.

55. Aland, ed., *Korrespondenz,* 2:517.

56. 4 G:83, MAFSt; Mühlenberg Diary, vol. 2.

57. Orders are in IV, C, G, and E, MAFSt. John M. Maisch, "G. H. E. Mühlenberg als Botaniker," *Pharmaceutische Rundschau* 4, no. 6 (1886) 119–29; Wolf Dieter Müller-Jahncke, "Der 'Linnaeus Americanus' und seine Beziehungen zu deutschen Botanikern: G. H. E Mühlenberg. Beiträge zu amerikanisch- deutschen Beziehungen in den Naturwissenschaften des 18. und 19. Jahrhunderts," *Deutsche Apothekerzeitung* 117 (1977): 1323–30; Wolf Dieter Müller-Jahncke, "Johann David Schoepf, 1752–1800: A German Physician as a Botanist and Zoologist in North America," *Pharmacy in History* 20 (1978): 43–64.

58. For one example of the German shipboard trade, see Rosalind J. Beiler, "From the Rhine to the Delaware Valley: The Eighteenth-Century Transatlantic Trade and Communication Channels of Caspar Wistar," in *In Search of Peace and Prosperity: New Settlements in Eighteenth-Century Europe and America,* ed. Hartmut Lehman, Hermann Wellenreuther, and Renate Wilson (forthcoming).

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Academic and Practical Medicine in Halle During the Era of Stahl, Hoffmann, and Juncker

Jürgen Konert

The Friedrich University, founded in 1694 in Halle, acquired within its first decade a significance that was appreciated far beyond its region. The beginning of its medical school was relatively modest, consisting of a pharmacy, an anatomy theater, and the obligatory hortus medicus. During its first decade, the medical school had only two ordinary (full) professors, Friedrich Hoffmann (1660–1742) and Georg Ernst Stahl (1659–1734).

Hoffmann was highly regarded as a Halle practitioner prior to his appointment. Born into a prominent family of apothecaries and physicians, his roots went deep into the patriciate of Halle. As *Professor medicinae et physices primarius*, he not only performed important founding tasks for the University (including drawing up the faculty statutes, designing the seal, and arranging the examination schedule) but also recruited a Jena classmate, Georg Ernst Stahl, for the second professorship.[1] That step contributed greatly toward the Halle faculty's rapid attainment of European significance. Stahl was virtually unique among researchers of the eighteenth century in questioning the mechanistic causal theories of the "new natural sciences"[2] and laying the foundation of a "Pietist medicine," while Hoffmann—who had been influenced by Gottfried Wilhelm Leibnitz—acted more as a mediator between the widespread materialism of the day and its antipode, animism. With Hermann Boerhaave (1668–1738) of Leiden, they comprised the triumvirate that inaugurated the medical enlightenment of the early eighteenth century by the reform of medicine.[3]

The wider fame of Friedrich University was due also to the presence of the legal scholar and exile from Saxony, Christian Thomasius (1655–1728) and the philosopher Christian Wolff (1679–1754), who arrived in 1707. The eminent scholars of the four traditional faculties created a dynamic environment of differing schools of thought that appealed to scholars from far beyond the immediate region. A second focal point of the city was represented by the orphanage foundations that were started in 1695 by August Hermann Francke (1663–1727) and became the center of Halle Pietism. Enlightenment and Pietism, mutually enriching in the early eighteenth century, made of Halle a scholarly and scientific center of European importance.

Hoffmann and Stahl were joined by a series of other full professors and associate (extraordinary) professors, many of whom

had been their students. Among them were Heinrich Henrici (1673–1728), botanist Johann Christian Buxbaum (1693–1730), anatomist Georg Daniel Coschwitz (1679–1729), surgeon Heinrich Bass (1690–1754), Michael Alberti (1682–1757), and Johann Juncker (1679–1757). Thanks to that faculty, the young *alma mater halensis* became the most popular among the universities of the German territorial states in the early eighteenth century. With the exception of the special case of Strassburg, the medical student census at Halle exceeded that of most other German medical schools combined until the 1740s. (see Table).[4]

Friedrich Hoffmann

Hoffmann became the primary spokesman for the medical practitioners of the first half of the eighteenth century who considered themselves progressive and scientific. To be sure, he made no groundbreaking discoveries; nor did he propound ideas that revolutionized medicine. His system, however, was impressive for its clarity, its direct and convincing literary style, and its coherence.[5] Those qualities were also responsible for his great popularity as teacher and physician. An observation from Johann Friedrich Blumenbach (1752–1840) reflects some of the reputation that the "Second Hippocrates" or *"Aesculapius Hallensis"* retained even decades later: "One cannot easily wish someone anything greater or more comprehensive than this—to be as gifted and happy as Friedrich Hoffmann."[6]

Hoffmann's elementary textbook, *Fundamenta Medicinae ex principiis naturae mechanicis in usum Philiatrorum succincte proposita,* appeared in 1695. Apart from some expansions, he never made substantial revisions to the work.[7] The general natural-philosophical principles of his system were overwhelmingly of Cartesian origin. Because of his training in iatrophysics, Hoffmann explained the main functions of the human body mechanically, in the sense of a hydraulic machine, and by means of mathematical and physical principles. In the center, however, was aether: the *primum movens.* For Hoffmann, aether alone was the source of the motion driving all physiological processes. Aether had a purely material character, with no spiritual powers. The "nervous fluid" had its center in the brain, distributing itself over the entire body through the nerves and regulating the tone of the fibers of the body. Hoffmann's theory of aether had nothing to do with Leibnizian monadology or Neoplatonism, however. Far from new, it was rooted in Aristotle, with further influence from Descartes, Willis, Bohn, and Boyle.[8]

Hoffmann's *Medicinae rationalis systematicae* (1717) set him apart from contemporary schools of medical thought.[9] He recognized the reality of chemical processes, in particular, but opposed exaggerating their importance. He concluded that many different principles acted as causal factors in any organic phenomenon but recognized only mechanistic *casus proxima.* For more distant causes, however, he admitted both chemical processes and the possibility of spiritual and psychological influence.

It followed from his theory that disturbances in the circulation of the nervous fluid would cause illnesses. Hoffmann's concept of treatment proceeded correspondingly: the first task was to normalize the circulatory disturbance. Drugs, therefore, were prescribed according to their mechanistic properties: whether they raised or lowered tension, whether they

Number of Medical Students at German-Language Universities in the Eighteenth Century

	1700	1710	1720	1730	1740	1750	1760	1770
Collegio Medico-chirurgico, Berlin*	—	—	—	72	164	185	481	637
Erlangen	—	—	—	—	—	53	103	98
Freiburg	22	12	13	19	10	25	18	76
Heidelberg	—	7	15	18	20	21	18	25
Leipzig	17	8	17	25	23	80	109	119
Strassburg	13	21	72	171	251	363	498	460
Tübingen	—	—	—	—	—	—	17	189
Würzburg	2	6	4	6	15	15	13	18
Göttingen	—	—	—	—	72	153	207	204
Halle	138	246	308	529	477	515	329	311
TOTAL	192	300	429	840	1,032	1,410	1,793	2,137

* Independent surgical college founded in 1728 for training of Prussian Army medical staff.
SOURCE: Johann Oehme, "Vorlesungen über Kinderkrankheiten im 18. Jahrhundert," *Der Kinderarzt* 16, no. 6 (1985): 879–86.

were stimulants or depletors. Among his important therapeutic agents were wine, camphor, cinchona bark, and iron. Exercise and a regulated diet were also important. During Hoffmann's professorship in Halle, which spanned almost half a century, he repeatedly criticized the abuse and polypharmacy that were typical of the age, and he emphasized the various possibilities of iatrogenic injury.

His research resulted in numerous dissertations, and he wrote copiously on popular medicine.[10] He investigated and developed countless medications, including "*Spiritus aetherus,*" the famous anodyne drops that are still known in Germany as *Hoffmanns-Tropfen.* He widely advertised his pharmaceuticals, which contributed greatly to his prosperity. Hoffmann's dual orientation to profit and medicine is not untypical for the period, when the juncture between medicine and the pharmaceutical trade tended to obscure the classic postulates of medical ethics.

Hoffmann was an opponent of "chemiatry" but—despite his adherence to traditional theories—regarded experience and reason as the bases of medicine. That was probably not only beneficial for the patients but also the reason for his expanding practice and personal reputation as a successful clinician in Berlin and beyond the German territories. He was member of numerous scientific societies, including the Imperial Academia Naturae Curiosorum Leopoldina.[11] Furthermore, he was trusted by many princes, whom he counselled in letters and who often consulted him on forensic matters. He was called to the Prussian court as *Leibmedicus* (body physician), and he accepted the position after some hesitation in 1709 without, however, giving up his academic

position in Halle. The situation at the court of Friedrich I Hohenzollern, however, was unsatisfactory; in 1712, Hoffmann returned to Halle, where he remained active as a physician and teacher until the end of his life.[12]

Georg Ernst Stahl

The first two decades of the medical faculty were dominated by the Hoffmann-Stahl dualism. Stahl sought to counter Hoffmann's technomorphic thinking and the medical ratio of mechanistic materialism with a more psychomorphic conception that synthesized *ratio* with *emotio*.[13] Stahl's concept of "animism" began with the soul, which maintained the body: movements of the body were also movements of the soul. *Anima* was the central concept and guiding principle; physical structure was simply its vehicle. According to Stahl, the anima was effective as a *"motus tonicus vitalis"* in circulation and was identified with parenchymatous tension. That tension in turn was the precondition for the passage of blood. Thus, the soul regulated the width of the pores in the parenchymatous system through which the blood moved.[14] That understanding of the function of the soul united ancient doctrines of the *pneuma* with Paracelsian concepts and Christian notions of the relationship between body and soul.

For Stahl, the body did not possess any independent attributes besides its geometrical dimensions. The body was passive, an "inert machine," until animated by an immaterial substance, the principle of life. The soul, therefore, was the first cause of all movement, but Stahl did not identify it with the "spirits" of Thomasius: to regard the body simply as God's machine was, according to Stahl, an absurdity.[15] Stahl's soul was closely linked with the body: "Neither can be what the other is, neither can exist without the other."[16] That was a return to Aristotle and a clear rejection of the mechanical concept of life.[17] The soul of which Stahl wrote was not mental activity but expressed itself in a vital movement that imparted life to the body. He expanded his theory so as to unite the Aristotelian-Galenic *facultas animi naturalis* and *vitalis et animalis* to form the *Ens activum* of the soul; in clinical detail, nevertheless, he postulated concepts similar to those of iatrophysicists and humoral pathologists (including plethora and thickening of the humors).[18] Stahl attempted to combine Aristotelian vitalism with current teachings of the Cartesians and iatromechanists.[19]

With his concept of *affective influence,* Stahl established the basis for a medical therapeutics that rested on two fundamental insights into the affective and the psychic constitution of the individual. Diseases arose when the soul was either overwhelmed by powerful affects or disturbed by a faulty assessment of a given situation. Since, however, the soul as anima made every effort to overcome dysfunction, it was necessary to assist it with therapeutic agents and to strengthen the body's restorative powers. Stahl's physiological ideas led to a pharmacotherapy whose main purpose was to support the self-regulatory efforts of the anima and the body. Such symptoms as bleeding or a fever, for example, were not to be regarded as signs of disorder but rather as an expression of and evidence for the regulatory power of the soul, which should not be suppressed by pharmacotherapy but instead should be supported or even strengthened by it. Stahl's faith in the body's own powers led him to an expectant, conservative therapeutics that

refrained from using cinchona or opium since their effects interfered with the self-regulatory power of the anima.

Stahl's therapeutics aimed to prevent the surfeit of blood and its thickening, which he saw as the most important causes of disease. He approved of bleeding, emetics, excretion, and secretion, all of which he stimulated with appropriate measures and medications. His pharmacotherapy aimed to ensure the right combination of bodily fluids with purgatives, sudorifics, and expectorants. He prescribed so-called blood-separators, including antimony preparations and spiritus nitri. He used mercurial agents as purgatives, and in high fevers he prescribed venesection and clysters.[20]

It must have been fascinating to have been a medical student at Halle and to absorb the theory and discourse of each professor. Although Hoffmann was certainly the better lecturer and attracted more students to his lectures, the combined activities of the two great physicians left a lasting impression on their students and on Pietist medicine in general.[21]

The Legacy of Pietism in Medicine

It has often been asked whether one can speak of a specifically Pietist medicine. It is not possible to answer that question conclusively until there is a truly comparative framework for assessing and distinguishing European medical practices at the end of the early modern period. It is a fact, however, that with the exception of Montpellier, the direct influence of Halle medical teaching on European universities was limited. The strength of that teaching was to establish a close interaction between medicine and the Pietist mindset. While that may have had important consequences for medical ethics, Pietist rigidity made it difficult to accept and absorb the emerging rationalism in medicine.

Apothecary's display table from the Naturalienkammer, Halle. The individual slots displayed specific simples. A metal grate protected the materia. Drawers below held additional stores. The curator's description appears on pages 4–5. (Photograph by Klaus E. Göltz, Halle, courtesy of the Franckesche Stiftungen)

I nonetheless would argue that in the specific circumstances of the Halle context, there was a Pietist medicine that created a unique framework of illness and cure. That framework, while not constituting a new orientation in science, did represent a new direction in medical practice. As such, it reflected and responded to many of the theoretical insights of the seventeenth century, which had little impact elsewhere on daily practice and the ordinary practitioner. For centuries, medical knowledge had grown very slowly, and classical theory was yielding only by the end of the seventeenth century. But while there was a revolution in scientific thought, even the academically trained medical practitioner provided essentially the same therapy that had been used for centuries. Polypharmacy was an important part of that therapy, and

the efficacy of any medication for specific diseases remained largely unknown. To question the usefulness of the gain in scientific knowledge, therefore, was both rational and reasonable; one consequence of that dilemma was a return to the traditional iatrotheological aspects, revised to provide a better fit with the new body of knowledge.

At first glance, it might seem that because Stahl's theory of anima was more evocative of the valuation of the soul in the new devotional world of Pietism, his medicine was more acceptable to Pietists than was Hoffmann's iatromechanism. The assumption of an immortal soul, however, was far from unusual in that period and was, in fact, a general property of Christian thought that Hoffmann, too, believed in. The two had been exposed to Pietist thought even before their Halle period, and they were sympathetic to the movement and to Francke.[22] Both had well-endowed and secure positions before they were called to the prospective *alma mater halensis*. They came to Halle with well-established connections to Pietism and to its representatives, and they collaborated toward the practical pursuit of Pietist goals.

There is still not much literature on the juncture between the Halle faculty and radical Pietism in its early stages. That such a connection could be fundamentally important is suggested by the innovativeness of Halle in comparison to other universities of the time.[23] Like the Enlightenment, Pietism was not located exclusively at the universities, but the movement served as the carrier and mediator of "new" knowledge and thus neither could nor wished to bypass the universities. They were the place where different streams of thought met, leading to consensus or provoking dispute, all of which promoted further investigation or elaboration. And that was the very secular problem besetting the relationship between Pietism and reform. Pietism brought its thought patterns and conflicts to a German university that had neither created them nor was likely to resolve them. Friedrich University was Pietism's first strong base because Francke and his followers launched their reforms from within it, which lent an institutional character to their efforts and enabled close cooperation from the state.[24]

The close links between Pietism and the medical orientation of Stahl and Hoffmann (and of their many students) produced structural differences from Enlightenment medicine that are clear when one compares the medicine of Halle with that of its contemporary, Leiden, or its successor, Göttingen, or the Catholic Enlightenment of the Vienna of Joseph II.[25]

In that context, one must point to a feature—hardly noticed so far by researchers—that indicates that the reception of medical knowledge was determined by new conditions. Pietism, with its stress on the propagation of knowledge through the vernacular, participated intimately in that development. Early publication of German-language medical textbooks inspired two other important trends—a genre of books devoted exclusively to the synthesis of Pietist devotional literature with Stahl's "*theoria medica vera*" and a new conservative therapeutics shaped by Pietism. In contrast, the influence of the Enlightenment seems to have differed little from that of Pietism on the development of pharmaceuticals, on the position of drugs in medical treatment in general, and on the widespread and successful drugs

produced at the Halle orphanage.[26]

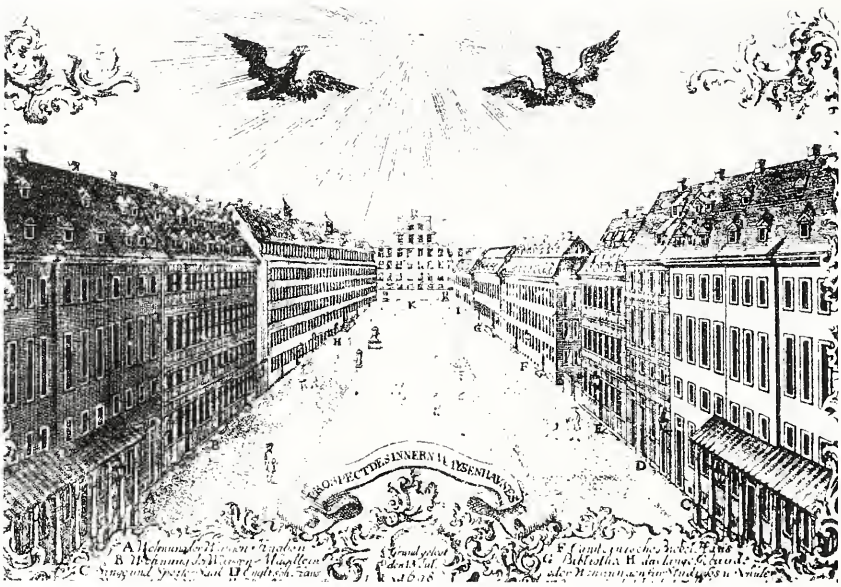
Both Hoffmann and Stahl supported Francke's reform goals for medicine, materially as well as ideologically. Stahl appeared to be more active because of the stimulating influence of his teachings on the movement for religious innovation: the "natural method" (as it came to be known) went well with the psychological introspection preceding Pietist rebirth.[27]

The symbiosis of Stahl's theory and the reform efforts of Pietism engendered a new era, an *Instauratio*.[28] Of all the natural sciences, medicine ranged foremost in the philosophical and anthropological thought of the era. Stahl's opinions on the need for medical reform are clear in virtually everything he wrote. Socially and ideologically, the ideas were embedded in Pietism but did not originate solely from that source. Moreover, they affected fields beyond the world of Pietism.

The Pietistic physician was a psychosomatic physician. For him, the strengthening of the patient's constitution was the deciding therapeutic criterion. The radical Pietists were among the most creative practitioners. It was, therefore, not just the Pietistic physician who was subject to a specific ethic: the patient, too, must search his soul and correct any errors.[29] Hoffmann and Stahl, despite their very different theoretical orientations, were united in battle against polypharmacy and polytherapy.[30] In clinical terms, the therapeutic skepticism of Hoffmann led to the same results as the expectant treatment of Stahl. For the patient, rejection of the contemporary pharmacomania was as useful as the call of the Pietists for greater care in determining whether medications were appropriate to the physical and mental disposition of the patient.[31]

The early Enlightenment and Halle Pietism were, in many respects, more similar than different. The Halle medical school represented a rare synthesis of Pietism and the emerging rationalism and empiriorationalism.[32] At the threshold of the eighteenth century, a new and improved understanding of disease was slowly evolving. In order to find a more rational basis for therapeutic indications than bedside observation of the patient, Hoffmann demanded that in addition to knowledge of the cause of disease and the condition of the patient, successful therapy required knowledge of the characteristics, attributes, and effects of the medications, including their usefulness in treatment.[33] Stahl made very similar demands. Both teachers enriched each other and their students in producing a practical therapeutics that tried to be rational.

As noted, an important characteristic of Pietist medicine was the strong interaction between religious teaching and medicine. Traditionally, priest and physician met at the bedside of the patient since they emerged as carriers of different messages: one's domain was the soul; the other's was the body. That was never an uncontested line of demarcation, but the Pietist physician extinguished it and assumed responsibility for both. That was particularly obvious in the work of Michael Alberti (1682–1757), a Halle graduate who eventually joined the faculty. The son of a Nuremberg minister, he had first studied theology but then found his way to the study of medicine under the influence and guidance of Francke and Stahl. In his preface to *Specimen medicinae theologicae,* Alberti summarized the Pietist medical argument, making specific reference to one of the standard and seminal works of



The Francke Orphanage Foundations of Halle, from a 1709 engraving. At top is the Francke Foundations emblem, two eagles ascending to the sun. (Photograph courtesy of the Franckesche Stiftungen)

seventeenth-century German Pietism, *Theologische Bedencken* by Philipp Jacob Spener (1635–1705).[34] Alberti's medical thought clearly relied on Stahl but emphasized more strongly than his teacher the religious component. He demanded not only that conscience alone be the guide of medical theory but also that the physician not advocate teachings that run counter to the majesty of the Lord.[35] Alberti emphasized the primacy of the soul, and he rejected a strictly materialistic therapy that would orient itself exclusively to natural events and phenomena. Alberti's premise was that all illness was lodged in the instruments of the soul, in the physical substratum, and that the soul itself could not become ill. The physician, therefore, was not an independent agent acting on the basis of rational thought but the tool of God, executing His will. Pietist ethics must be seen in the framework of that thought. It was the major task of the physician to improve the condition of the body so that cure could arise through the agency of the soul—in other words, through God.

Clearly, those theoretical views were not the exclusive guide of Alberti's teaching and practice. He was one of the founders of forensic medicine, a field that reflects Hoffmann's thought. There is a similar distance between rhetoric and practice in other Stahl students.

Johann Juncker

Johann Juncker made a unique contribu-

tion to Halle's fame as one of the most progressive and popular German medical schools of the early eighteenth century. From 1717, the year of his arrival, the *Collegium Clinicum Halense* symbolized a reform of medical education that was hardly inferior to the achievement of Boerhaave. The young university was already suited to become a model of a new kind of medical education, particularly because of its close connection with Francke's foundations.

Clinical institutions for inpatient care had been planned almost at the start of Francke's educational facilities in the early 1700s. An early infirmary was reserved for resident students and personnel and was later replaced by hospitals owned by the foundations. The care of the bedridden patients was the duty of the *medicus ordinarius orphanotrophei*. Johann Daniel Gohl (1674–1731), Christian Albrecht Richter (1674–1699), Christian Sigismund Richter (1672–1739), and Christian Friedrich Richter (1676–1711) all worked there under the formal supervision of Stahl. Documents in the foundation archives indicate that the brothers Richter repeatedly permitted medical students to accompany them on their visits to the infirmary. The beginnings of clinical demonstration, therefore, go back to the first institutional physicians, of whom Gohl and later the Richters acted officially as *doctores legentes* (lecturers without academic rank). The situation even in those early years, therefore, was not greatly different from that in the older Leiden.[36]

Apart from the care of inpatients, the Francke Foundations early on offered a walk-in clinic, or dispensary, for the poor in accordance with Pietist principles of charity reform. Patients were treated without charge and were provided with medications and other necessities under the supervision of the *medicus ordinarius*.[37] The outpatient service was quite demanding, and the institution physician soon felt compelled to draw in *provectiores* (medical students working with physicians of local standing) for their assistance in the consulting clinic.[38] Students thus obtained the knowledge and experience that, in other places, was available only to practicing physicians. The issues of education and training, however, were not in the foreground; rather, the purpose was to provide medical assistance to the needy.[39] Francke's 1708 *Project von der Verpflegung der Kranken* was intended to be first and foremost a task of charity and piety. In that project and elsewhere, he referred only marginally to the relationship of care to the goals of medical education: "*Studiosi medicinae haben dabei . . . wie sie künftig ihren Patienten bey der leiblichen Cur auch an den Seelen dienen können*" (*Studiosi medicinae* will have the occasion to have some thorough practical training . . . and by observing the Christian manner in which the sick are treated here, they will gain not only a profit for their own souls but [learn] how to join the physical cure of their patients to that of their souls).[40]

But the institution of medical facilities and the generous funding provided by the Francke Foundations were only beginnings.[41] After 1717, Juncker transformed the existing hospital wards and treatment and demonstration spaces into a true collegium clinicum. Until then, academic teaching at Halle had traditionally and exclusively relied on lectures and disputations. Juncker's unique contribution was to integrate the medical facilities into an entirely new pedagogical method. In short, he revolutionized the teaching of medicine in his time and region.

Juncker had come to Halle in 1697 as a student of philosophy, and he soon came into contact with the circle around Francke. From 1701 to 1702, he also worked as *informator* at the *Paedagogium Regium*, the school for the nobility that was part of the Francke educational scheme.[42] He then left Halle but was called back by Francke in 1717 to fill the position of *medicus ordinarius* for the foundations. One year later, he defended his dissertation, with Michael Alberti as the chairman of the board of examiners. Both were passionate admirers of their former teacher Stahl.

Juncker's allegiance to Stahl derived from his own experience within the Francke school system, where Stahl's theory of the anima was found to be of greater significance in the theological conceptions of Halle Pietism than the Cartesianism of Hoffmann. Juncker also realized that Stahl was not simply a physician but a universal man of science and regarded Stahl's ideas as offering the key to the entire system of contemporary medicine, which then incorporated chemistry and other natural sciences. All of that explains the enthusiasm expressed by Juncker as an interpreter—and not always an accurate one—of Stahl; Juncker included in his own writings such phrases as "*methodo Stahliana,*" "*e dogmatibus Stahlii*" or "*ex praxi Stahliana.*" Juncker, however, often went his own way; in his clinical practice, he diverged from preconceived ideas when they conflicted with clinical observation.[43]

Juncker published several textbooks on the Stahlian method, which served as a compendium for training students. Concentrating on mainly practical needs, the treatises propagated the merits of Stahlian expectant therapy: one should rely on the body's own powers and intervene only in order to regulate the *vis naturae*. Interventions that disturbed self-regulation were rejected; and, like Stahl, Juncker opposed the reduction of fever by cinchona and relief of pain by opiates. Certainly, the experienced Juncker followed his teacher but was elastic enough in his schemes to recognize valuable practical experiences:

> No physician can say that a single patient would die of this fever if one does not intervene. Many more must acknowledge that the safest and most thorough method is to eschew heroic cures and "stoppers" and support the work of nature with facilitating medicaments, especially when a marked plethora or "needy" viscera combine together. . . . If one says that there are certain cases where the fever continues even after the harmful materials have been removed from the body, I would not completely reject that opinion but must, nevertheless, declare that I have never encountered such a case.[44]

Plethora and impurity—the chief causes, according to Stahl, of many illnesses—must, from that perspective, be influenced by eliminatory measures. It follows that venesection or the administration of agents stimulating secretion and excretion in carefully selected dosage and at the right time were crucial in Juncker's concept of treatment. But prophylaxis had its place too: Juncker repeatedly recommended moderation, physical exercise, and the maintenance of mental harmony.

Their relationship to practical issues made Juncker's works popular as textbooks, evident from the rapid publication of edition after edition. His *Conspectus Chirurgiae* was translated and published in German in 1722 and could thus offer instruction to the manual surgeon not well versed in Latin. The second and third

editions of the *Conspectus Medicinae Theoretico-practicae,* devoted to the theory and practice of medicine, were published in 1724 and 1732. The *Conspectus Formularum* was published in expanded form in 1730. In those works, the value of contemporary pharmacotherapy was discussed repeatedly in relation to expectant treatment and nonpharmacological stimulation of the "*motus naturae.*"[45]

Juncker had the opportunity of applying his theoretical postulates at the bedside in his work as institutional physician. The most prominent achievement of his forty-year career in Halle was the foundation hospital. When he started his work in 1717, the first student hospital was only nine years old, but the "House on the Weinberg" was already inadequate. The new building, the "Infirmary in the field" was finished in 1723. The number of patients available there for purposes of clinical instruction was considerable: twelve hundred patients were treated between 1730 and 1737.[46]

But the admission of outside patients originally intended by Francke in his *Project* remained an exception rather than the rule. Treatment was mainly pharmaceutical, despite the original injunction that the students on the charity wards might gain an opportunity "*sich in der Chirurgie zu exercieren.*" Juncker did not follow Francke's early advice, however, and surgical treatment took place under medical supervision by barber-surgeons, apparently in large part due to professional and guild jealousies.[47] Thus, we can hardly speak of practical surgical instruction, despite Juncker's progressive vision of medical training. Similar problems arose in the case of dissections, which had been planned but were not official practice in the orphanage hospital.

There is not enough information about the actual course of ward and ambulatory practice in the Collegium Clinicum Halense to permit more than a summary description. The large number of patients seen in the ambulatory setting (according to Werner Piechocki, around twelve thousand per year, or thirty-five per day) raises questions as to the actual facilities used and the numbers of students and physicians required.[48] Juncker's claim that the free use of the orphanage medications in charity practice contributed to their commercial success was probably accurate.

Juncker's practical and pedagogical successes were acknowledged with an associate professorship in 1719 and a full professorship in 1729. He remained true to his reform program throughout his whole life, and the collegium clinicum runs like a red thread through his organization of teaching. Even after his death, the office of the institutional physician and, for a certain period, also the professorship remained with his family. He was followed by his son Friedrich Christian Juncker (1730–1770) and his prolific grandson Johann Christian Wilhelm Juncker (1761–1800).[49]

Early Pediatrics

Apart from the Collegium Clinicum Halense, Francke's foundations were associated with another Pietist medical innovation. Stahl and Hoffmann had devoted particular attention to the diseases of children in their early studies at Jena with Georg Wolfgang Wedel (1645–1721), who, like his Leipzig colleague Michael Ettmüller (1644–1683), considered pediatrics to be of the greatest importance.[50] Wedel's *Morbis infantum* and Ettmüller's *Valetudinarium infantile* were essential to the transmission of pediatric knowledge.

Hoffmann also delivered many lectures on the maintenance of young people's health.

Not accidentally, the first lectures on pediatric topics in German universities were given by professors in the fields of anatomy, surgery, and gynecology. At Halle, Georg Daniel Coschwitz (1679–1729) included discussions of specifically pediatric themes in his lectures from 1718, as did Alberti from 1728 and Philipp Adolph Böhmer (1717–1789) from 1741. Coschwitz, as Alberti, had Pietist leanings and considered himself a student of Stahl. The associate professor Heinrich Bass, also a member of Stahl's circle, gave an exclusive lecture on pediatrics in 1740.[51]

In the middle years of the century, Friedrich Leberecht Supprian (1723–1789) did extensive work in pediatrics, and he referred in his lectures to Johann Heinrich Schulze (1687–1744), a student of Stahl's and later professor at Altdorf. From the time that Juncker incorporated pediatrics (at least in terms of the characteristics of the patient population) in his teaching program, the subject remained well represented, although it did not yet exist as a specialty.

The fact that the *Academia Fridericiana* instituted pediatric lectures very early, however, was explained by conditions specific to Halle. Not just a university was established there: Francke's foundations led to the growth of a rather large "school town" outside the gates of Halle. The administrators of that new "town"—and its hundreds of children, adolescents, and students—immediately posed specific health problems for the medical faculty affiliated with the orphanage. The *medicus ordinarius*, for example, would determine with orphanage and school inspectors about the best kinds of labor for orphans and students; such work as garden upkeep was justified as a kind of motion-therapy. The physician and the inspector further determined what occupations were suitable for patients and whether a restorative diet was required. The so-called "half-sick" (discharged children who needed aftercare) were also treated. Dependent on the availability of room in the hospital, "weak children" were also admitted for observation. The *medicus ordinarius* was an ex officio member of the committee in charge of the administration and oversight of the foundations. Conference minutes provide an interesting view of the foundations' approach to medical issues and the responsibilities and activities of the responsible physicians.[52]

Hoffmann's greatest contribution to pediatrics was in the 1740 supplemental volume to his *Medicinae rationalis systematicae.* His treatise on children's diseases was titled *De praecipuis infantum morbis,*[53] and a German version appeared within a year. It was evident from that book that the author had ceased to regard children as miniature adults but was attributing specific traits to them. Hoffmann recommended an extensive anamnesis through interrogating the mother and a detailed examination of such features as whether there was "external redness due to inflammation or a hot breath in the mouth cavity, or blisters on the palate or swollen gums." With regard to the care of the newborn, he pronounced against tight swathing, harmful "prechewing" of porridge, and nursing by the mother. He proposed a nursing schedule in the "first months [of] every two hours, after three months, six times, and finally only twice or three times."[54] He shared the belief that mother's milk could be harmed by fear or rage.

A larger popular work, which Hoffmann

predicted would be "very important and useful to all intelligent mothers and midwives in cities as well as the countryside" was the 1748 German edition of his treatise *Vernünfftiger Unterricht von heilsamer Vorsorge eines zur Welt gebohrnen und Saugenden Kindes.*[55] In the first part of the book he provided directions for maintaining a child in good health, and in the second part he provided advice on how to counteract specific diseases. It was evident from both treatises that, in matters of practice, Hoffmann again accorded greater weight to experience than to his own theoretical beliefs.

Stahl, too, concerned himself with the diseases of children. His *Kurtze Untersuchung,* which appeared in 1718, used Pietist reasoning to further the objectives of popular medicine. He emphasized, however, that sick children required the help of the skilled physician. He divided children's diseases into congenital and those with external causes, with the latter being predominant. He recommended opening of the bowels in constipation and the use of adsorbents and sudorifics. While he considered most children's diseases to be self-limited, with nature limiting their course to at most seven days, he recommended excretion as essential during any period of illness.[56]

In *Gründliche Untersuchung der Kranckheiten,* Stahl classified human life into four primary stages: childhood, youth, adulthood, and old age.[57] The first stage comprised infancy to age seven; the second, to age fourteen; the third, stable adulthood; and the fourth, decline into feeble old age. The diseases of the first stage , according to Stahl, were accidents centering in the area of the head, which he attributed partly to the growth of hair or teeth.

Orphanage playground and athletic field as pictured in Die Stiftungen August Hermann Francke's in Halle *(Halte: Büchhändlung des Waisenhauses, 1863).*

Stahl detailed the most common and most important children's diseases in the last chapter of his *Observationes clinico-practicae,* a guide for practicing physicians that was published after he left for Berlin. In that work, Stahl divided children's diseases into two groups: those due to impeded movement of the lymph and those due to constipation. The former could give rise to fever and cough, restlessness, or excema of the face or skull; while the latter could cause joint and limb pain, burning stools, sleeplessness, grand mal epilepsy, and discolored stools. He agreed, moreover, with Hoffmann that mother's milk, when spoiled by "fear and rage," could cause diseases.[58] One can judge how widespread Stahl's influence was from, among other sources, "A Treatise on the Teeth" by Philipp Pfaff (1712–1766).[59]

The Juncker family was also influential in the new field of pediatrics. Johann Juncker set down his practical orphanage hospital experiences in numerous articles. Apart from his position as the orphanage

physician, he published many pediatric articles in the *Wöchentliche Hallische Anzeigen.*[60] That newspaper, published by the Francke foundations, propagated and supported the Pietist movement and had a marked interest in the popularization of science. Within the first two decades of its existence, it had published nearly forty articles on the diseases of children, including articles by Alberti and Johann Samuel Carl.

The early years of the Halle medical school show that although Hoffmann and Stahl were on opposite poles in their theory, they and their students led in the development of a new medicine, much of it based in Pietist belief, in which clinical experience became more important than theoretical concepts. For the medical historian, it is an interesting contradiction that therapeutic success counted more than theory. That appreciation for clinical outcomes is what made Halle medicine so attractive to early-eighteenth-century patients and so popular across national and continental boundaries.

♦

Notes

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How Shall I Take My Medicine? Dosages and Other Matters in Eighteenth-Century Medicine

John K. Crellin

[B]e assured, that the true and only Secret in Physick, is, How to give a Medicine and not how to make it.

—John Quincy, 1719[1]

A recent article on the contemporary herbal scene, "Dosage Considerations in Herbal Medicine," opened with the comment: "The subject of appropriate dose is probably the most controversial aspect of contemporary Western herbal medicine."[2] This paper explores dosages in the eighteenth century through textbooks and the George de Benneville manuscript, ca. 1770. It will be shown that dosage (or posology) was a significant, albeit not necessarily controversial, aspect of trends in eighteenth-century medicine. I also consider the topic in the context of current discussions on the effectiveness of medical therapy in the eighteenth century.

Effectiveness and Other Issues

Did eighteenth-century remedies "work"? J. Worth Estes, in a recent issue of *Caduceus* and elsewhere, has vigorously denied the "therapeutic" effectiveness of most medicines of the past. "Inasmuch as most historical drugs in the protopharmacological past could not have had any truly beneficial therapeutic effect (save in a very few instances)," he wrote, "one can only wonder why patients continued to patronize their physicians during all these centuries. And why did patients continue to pay for what can now be recognized as ineffective remedies?"[3]

Estes, who followed many other historians in offering negative opinions of the effectiveness of past therapies, answered his question by saying that satisfaction existed because patients got better. Yet that was due, he wrote, to the "successful operation of the *vis medicatrix naturae*, the healing power of nature, made possible by the body's ability to heal itself with the immune, phagocytic, and tissue repair mechanisms, at least when dietary intake permits." Admittedly, Estes noted vomiting, catharsis, and sweating properties, but he added that neither those effects nor the drugs themselves "could have significantly altered the course of most illnesses."[4]

Although there is substance to the views of Estes—after all, eighteenth-century physicians often vigorously criticized many existing therapies—he bypassed various issues that may need to be assessed in any

final analysis of efficacy. Some students of therapy, in contrast to Estes and others, take a relatively positive interpretation toward the value of medicines of the past. Historian John M. Riddle, for example, in correlating new scientific information with the historical record, has offered circumstantial arguments for the efficacy of some ancient treatments.[5]

It is not surprising that different viewpoints arise over questions of effectiveness—if only because of worries over interpreting through modern concepts, a form of presentism. There is also a lack of pharmacological and clinical knowledge about the materia medica of the past, especially of the effectiveness of combination preparations in the doses used. Moreover, it needs to be remembered that many older drugs and treatment regimens were pushed to one side in the belief that new remedies—introduced without clinical trials—were more effective, which, in many instances, turned out to be questionable opinion.

How, exactly, do we define *therapeutic effectiveness*? After all, various shades of meaning exist (depending, in part, on a patient's expectations of a treatment). There is good reason to think that many eighteenth-century treatments eased or relieved symptoms. And although we must, as said, beware of presentism, there is every reason to believe that making patients comfortable can indeed ease their minds. In turn, that form of ease, like tailoring treatment to the specific needs of a patient, has long been felt to contribute to the healing process—perhaps through the all-pervasive placebo response. Medical anthropologists also stress that belief systems and other cultural factors can foster positive outcomes.[6]

It is evident that much more detail about the therapeutics of the past is needed before we can attempt, with any confidence, general—or, for that matter, relatively limited—judgments about efficacy. Dosage and type of preparation are just two considerations.

Doses and Trends to Standardization

Offering meaningful comments on doses—even for the relatively short time span of the eighteenth century—is challenging because of the inconsistency and diversity of known formulae or recipes. During that time, numerous recipes—perhaps including "Dr. Chinye's approved purge, necessary for families"—were collected, passed around, and handed down, sometimes with mistakes in copying. "Dr. Chinye" was probably George Cheyne (1673–1743). Mistakes in copying are difficult to prove with certainty but seem evident from differences in ingredients and quantities from extant formulae, such as Queen of Hungary water.[7]

Within professional medicine, empirical and theoretical approaches accounted for at least some of the different dosage recommendations. Arch-empiricist William Heberden told students in London in 1743 that "nothing but our own Experience is true in fact."[8] Nevertheless, theoretical concepts undoubtedly shaped interpretation in many ways. A plethora of concepts existed—from vitalism to the need to balance humors, solids, or fibers, for example—often in a confusing, overlapping manner. Although there were some "specific" treatments, emphasis was often placed on treatments to restore balance through, for instance, "cleansing," "strengthening," reducing fevers, or "sweetening" the blood. The choice of

remedies was often a search through one's experience, guided by current or favored theory.[9]

It is not surprising, therefore, that physicians approached drug treatment in differing ways, and some were certainly more cautious than others in their recommendations. William Buchan, in his celebrated *Domestic Medicine* (first edition, 1769), noted that while medicines "may do much good" when administered with prudence, "when they are put in place of every thing else, or administered at random, which is not seldom the case, they must do mischief."[10]

The diversity of suggested doses aroused patients' concerns, encouraging such questions as "How much should I take?" or "When and how often should the medicine be taken?" Aside from specific worries over poisons as medicines, there was a clear trend toward improving the quality and standardization of medicines. Indeed, this embraced many factors, including (1) concerns over the accuracy of compounding due to the coexistence of both troy and avoirdupois weights; (2) the "application of chemistry," in part through studies on different menstruums to extract more effectively the essential components of various items of the materia medica; and (3) the simplification of formulae of compounded polypharmaceutical preparations. The last consideration, well known to historians, included efforts to establish a more standard approach to prescriptions, specifically, to formulate them in the following four parts (preferably using four ingredients): the *basis* (the most important ingredient), the *adjuvans* (to promote and assist the action of the basis), the *corrigens* (to remove unpleasant or noxious qualities of the ingredients without impairing their virtues), and the constituens (for preparing the ingredients into a presentable and palatable medicine). Indeed, simplicity of formulae became the watchword among many authors.[11] Hieronymus David Gaubius, a noteworthy proponent of such revision and of careful dosage, developed a posology table, another aspect of standardization. That table, which continued to be widely known through the nineteenth century, offered proportional doses for ages 1, 2, 3, 4, 5–7, 8–14, 15–21, 60–69, 70–79, and onwards.[12]

Any detailed consideration of the story of doses also needs to examine the growing number of proprietary medicines, which reflected both the entrepreneurship of eighteenth-century health care and the commercialization of home medicine. Although precision of dosage was hardly necessary for most proprietary preparations, leaflets accompanying the celebrated Dr. James's Fever Powder (patented in 1747), for example, recommended a range of doses according to the patient's ailment. It included the following instructions: "Let the patient take in Bed, half, or a third, or one of these Papers [Powders] mixed in a spoonful of Panada, any Syrup, Jelly of Currants, barley Water, Gruel or any Sort of Tea, taking care that none of the Powder is left in the Spoon."[13]

Physician James also recommended grain doses, although he offered the following observation about professional options regarding dosage: "The above Directions were calculated for the Use of the common People, and point out nearly the Methods which ought to be pursued. But persons vers'd in Practice will readily distinguish the Times and Occasions, when the rules here laid down are punctually to be followed, and when not; and will

adapt them to particular Constitutions, Climates, Seasons, and Circumstances."[14]

Home medicine chests, which grew in popularity during the century, contained a range of conventional medicines. The accompanying instructional guides, though less specific than those of the nineteenth century, also recommended some doses that required weighing. Guides were not always adequately updated, however. It is noteworthy that occasional doses for a Halle Orphanage magisterium, for example, throughout the eighteenth century, were given as "knife points" or "pea-sized," certainly anachronistic by the end of the 1700s.[15]

General Dosage Guidelines in Textbooks

Given the importance of dosage, it is paradoxical that relatively little general attention to appropriate dosage is found in eighteenth-century medical textbooks. Guenter B. Risse has commented that, because of the great diversity of therapeutic behavior exhibited by practitioners in all ages, it was imperative that certain parameters of "normalcy" be defined by medical treatises, pharmacopoeias, dispensatories, and other sources.[16] Yet many of those volumes offered doses primarily for compounded preparations alone, with no general advice or discussion. Exceptions include Jean-François Coste's *Compendium Pharmaceuticum* (1780). Written for the French military hospitals in North America, it reflected a concern for precision. Coste remarked:

> Those prescriptions marked "immediately" are to be administered shortly after [the physician has made] the rounds.
>
> Those [marked] "tomorrow", [are to be administered] at least two hours before [the physician] visits [the patient the next day].
>
> Those [marked] "for the evening", at about seven o'clock.
>
> It is the duty of the apothecaries themselves to administer all medicaments and all doses prescribed to be given [the patient] at different times.[17]

Coste not only gave a sense of precision but also reflected the philosophy that appropriate doses depended on the individual patient's constitution and disorder—and, of course, on the experience of the practitioner. That philosophy remained throughout the nineteenth century, although there was a discernable tendency to accept uniform doses for adults. The preface to the 1867 *British Pharmacopoeia*, for example, noted this new feature: "[T]he doses of all the more important medicines are now for the first time appended to the other information concerning them, the quantities stated under this head being intended to represent average doses, in ordinary cases for adults."[18]

Herbs. The philosophy of tailoring dosage to the requirements of individuals still meant that there was a need for general guidelines. What, for instance, might be described as a baseline dose? This author's ongoing review of a large number of texts from the early seventeenth century through the late 1800s has revealed what can be called a general dosage guideline for those herbs that were not particularly "strong" or dangerous. Specifically, a reasonable adult dose might be half a drachm (a drachm being about four grams, or a teaspoonful) up to one drachm of crushed or powdered herb; some writers tended more to half a drachm, and others to one drachm. So far as one can judge, the most important factors in deciding

whether to use the lower or upper end of the range were gender and age. Although, as noted below, there were other considerations as well.

The general dosage of half up to one drachm remained conspicuous through the 1700s and into the present century; it was a fairly common recommendation for "new" herbs as they became incorporated into the conventional materia medica. For instance, when American physicians contributed to post-Revolutionary War nationalism by promoting native herbs, a dosage in the order of half to one drachm was a baseline. William P. C. Barton, for instance, in his influential *Vegetable Materia Medica of the United States* (1817–1818), gave many doses in that range (e.g., *Cornus sericea*, half to one drachm; *Symplocarpus foetida*, thirty to forty grains; and *Eupatorium perfoliatum*, twenty grains to a drachm). Of course, many other doses, either larger or smaller (e.g., for such well-known poisons as belladonna and hemlock) were also noted.[19]

Some doses were explicitly based on the physician's own experiences and recommendations. Illustrative is Barton's account of *Euphorbia ipecacuanha* (recognized as a "strong" medicine), which is striking from today's perspective:

> Induced by the sensible properties of the plant . . . I last year determined to give a fair and extensive trial to the medicinal virtues of this species of Spurge. A portion of the dried root was finely pulverised, and administered with caution to various patients. I at first commenced with small doses of three, four, and five grains. In this quantity the powder nauseated, and produced a determination to the skin, as small doses of Ipecacuanha do. On increasing the number of grains to ten, vomiting was produced, with occasionally an operation on the bowels. Fifteen grains I found sufficient to produce full vomiting in most cases; and in a single instance, having given the powder to the extent of twenty-five grains, I had reason to be alarmed at the violent cathartic effect which ensued, and continued for fourteen hours, attended by distressing sickness of the stomach.[20]

Barton was seemingly prudent in his dosage recommendations, as were John Redman Coxe, Jacob Bigelow, and certain other physicians who wrote on medicinal plants for American readers.[21] There was, after all, an appreciation of graded increases of dosages as part of routine management.

Swallowing a crude herb in the amount of, say, a drachm is hardly easy, even if mixed in honey or syrup. During the early decades of the eighteenth century it is not surprising, therefore, to find many recommendations to mix the herb in wine ("in a glass of Canary in the morning," perhaps). On the other hand, many recipes clearly included a vehicle that was intended to add to the therapeutic value of the preparation. This decoction of wormwood, intended as an ague remedy, was published in 1731: Twenty grains of sassafras root mixed with ten grains of snakeroot, taken in two spoonfuls of decoction of wormwood every morning and evening.[22]

Infusions. An alternative, long-standing way to deal with the difficulties of swallowing a powdered herb was to make a simple aqueous extract, either an infusion (which was steeped in hot water) or a decoction (which was boiled in water). Recommended doses were commonly between one and three fluid ounces. Meaningful comparisons of different doses of infusions and other preparations is impossible, however, without knowledge of

concentrations and methods of preparation. Even so, a guideline for the appropriate strength of most infusions became generally accepted in the eighteenth century—adding one ounce of an herb to a pint of boiling water and allowing the mixture to stand for approximately ten minutes. That method resulted in a one-to-twenty concentration, a ratio that remained common into the present century. Barton, for example, remarked that "when used internally [*Baptisia tinctoria*], I consider an ounce of the recent root to a pound [roughly a pint] of boiling water about a suitable proportion."[23] The same issues applied to concentrations, tinctures, dosages, decoctions, and other forms of preparation.

Frequency of Administration. Matters of dosage obviously depended on more than quantity of medicine per dose; frequency and times of administration were also significant. General discussions on times of administrations of dosages, as of quantities, were uncommon, although *Quincy's Lexicon Physico-Medicum Improved* (1802) did offer the following directions: "*Medicinal Hours*, are those wherein it is supposed that medicines may be taken to the greatest advantage, commonly reckoned in the morning fasting, about an hour before dinner, about four hours after dinner, and at going to bed; but in acute cases, the times are to be governed by the symptoms and aggravation of the distemper."[24]

Such recommendations as morning fasting were long-standing, but a practice that grew more pronounced through the 1700s was the usage of regimens, particularly *twice a day* and *three times a day*. Reasons for this trend are not entirely clear, but perhaps they indicate a sharpening appreciation of the need of repeat dosages for such conditions as dysentery, frequent belching, chest conditions, and edema, to mention just a few. Moreover, there is a sense that detailing regimens was part of the trend toward the standardization of medicinal preparations earlier described. It is not clear whether regimens were to be followed three or four times over "twenty-four hours" or per day (implying time when one is normally awake), although the latter became the most common recommendation.

More important, did the detailing of regimens reflect a tendency to less and less tailoring of dosages to individual patients—in other words, a trend towards a *pro forma* approach to prescribing? John Ayrton Paris in 1843 seemed to reflect some concern over changing dose regimens when he wrote: "Remedies that require to be quickly absorbed will probably be more efficient in the morning after sleep; the old custom of giving medicines in a morning, fasting, is not quite so absurd as some modern practitioners have been led to suppose."[25]

Moreover, Paris was at pains to emphasize the "general influences" that had to be appreciated in determining an appropriate dose—specifically, age, sex, temperament, constitutional power, habit, diet, profession, time of day, idiosyncrasy, climate and season, nature and duration of the disease, influence of imagination, and variable activity of the medicine. Doses, as he stated, had to be learned by experience.[26]

I have so far suggested that there was something of a paradox in eighteenth-century Anglo-American medicine—while dosage was clearly recognized as a key part of everyday practice, there was a relative silence on the subject in textbooks. Guidelines probably emerged more from

practical training than from textbooks. That leads to a further question, What were the limits, the parameters, that shaped everyday practice? Unfortunately, gaining an understanding of the fine detail and nuances of practice is fraught with difficulty because of the limited number of available studies as well as a scarcity of fully detailed manuscripts—casebooks, prescription books, commonplace books, diaries, and so on. The de Benneville manuscript is a fine, if somewhat enigmatic, example of such a resource.

The George de Benneville Manuscript: A Potpourri of Issues

The structure of this eighteenth-century manuscript, accepted as being compiled by George de Benneville Sr., is outlined elsewhere in this issue (see Woodrow Savacool's "Illness and Therapy in Two Eighteenth-Century Physician Texts"). Unfortunately, the lack of information about its origins leaves its purpose open to interpretation. The manuscript, if anything, reads like a draft—perhaps an initial draft—for a dispensatory, albeit with an extensive section on the treatment of diseases.[27] It may well be a compilation, but it is not a commonplace book for medical jottings, cases, or ruminations; indeed, no names of medical authorities are mentioned. It may be, too, that it does not reflect the general everyday practice of most physicians in Pennsylvania, despite the title page, *Medicina Pensylvania; or, The Pensylvania Physician*. On the other hand, it is difficult to believe that at least some of the practices of George de Benneville, a physician in colonial Pennsylvania after his arrival in 1741, are not incorporated in the volume. Even so, it is perhaps surprising that no references exist to proprietary medicines (not even from the Halle Orphanage), for we know that they were employed by many physicians of the time, including Benneville's contemporary immigrant physician and friend Abraham Wagner.[28]

The eclecticism of eighteenth-century medical theory and practice is reflected in de Benneville's manuscript. Although his European background did not lead to any noticeable influence from, say, Boerhaave, Stahl, and Hoffmann, references to Paracelsian concepts are very evident although unacknowledged.[29] Apart from the specific discussion on Paracelsian notions of tartars, there is a pervasiveness of Paracelsian terms throughout the text, such as the use of "panacea" as part of the initial treatment regimen for almost all conditions considered in the manuscript. We should note, however, that while panacea (or panacea antimony) was a well-known Paracelsian remedy (for which a recipe is given in the manuscript), it had become widely used without a specific Paracelsian connection. It was even the basis of such commercial preparations as the celebrated Lionel Lockyer's pills.[30]

Given the Paracelsian influence, one might ask whether the de Benneville manuscript is an exercise in compilation and German-to-English translation for the use of a mixed Pennsylvania audience. After all, included is a very useful Latin, German, and English compendium of names of items of materia medica. On the other hand, favoring originality of the manuscript—at least in part—are references to, say, senega snakeroot, ginseng, and the many teaspoonful dosages, all of which suggest that the date that has been attached to the manuscript, ca. 1770, is not unreasonable. Nevertheless, an earlier date, by up to two to three decades and reflecting the author's training, is a possibility.

Despite uncertainties about the intention of the manuscript, its comprehensiveness and its mix of both long-standing and new practices raises intriguing questions about dosages. Two are considered here, teaspoon doses and the usage of "external" vehicles. A particularly noteworthy feature is the overwhelming number of teaspoon doses. That "measure" of a medicine became popular in the colonies only around the 1740s—when de Benneville was establishing himself in his Pennsylvania practice—although national differences (between Germany and the colonies) have not been determined.[31] Of the dosage recommendations in the de Benneville manuscript, there are 265 teaspoon doses (mostly tinctures, but some solids), thirty-one drop doses, thirty grain doses, sixteen dram doses, fifteen as pills, ten ounce doses, six tablespoon doses, five scruple doses, and three doses in pints (or parts thereof).

Although it is not easy to interpret the preponderance of teaspoon doses, it is significant that most are for tinctures. The teaspoon dose avoided the use of drops, a common although not particularly convenient dose form widely used for many tinctures. At the same time, a teaspoon dose may have been on the high side for strong medicines, as it was on the low side for others. Yet, as noted earlier, such dosage information is meaningless without knowledge of the concentration of the tincture. De Benneville recommends an eight-day maceration period for many tinctures, which was not an uncommon directive in dispensatories; other periods of time (less and greater than eight days) are equally common. One may ask, Was the author of the manuscript trying to standardize the preparation of tinctures so that teaspoon doses were appropriate? Perhaps, but in order to obtain any real sense of an answer, a detailed comparison with formulae from many sources is needed, which is beyond the scope of this article.

Recommendations for the frequency of administration of doses is another noteworthy feature of the de Benneville manuscript. Striking is the frequency of regimens of twice or three times a day, albeit interspersed with such occasional specifications as morning, noon, and night. There is also the occasional anachronistic suggestion (at least for the date and character of the manuscript) that a vermifuge be taken in a dose of one "scruple to one dram in the decrease of the moon."

The drift of the discussion so far is to suggest that the de Benneville manuscript is in keeping with eighteenth-century efforts to improve or standardize preparations and doses, just as can be discerned in the story of the Halle preparations considered elsewhere in this issue by Renate Wilson. On the other hand, there are a striking number of recommendations that call for swallowing a tincture in a dose of tea, albeit *without* any directions for the strength of the tea. The few de Benneville recipes for infusions (teas) offer no guideline whatsoever.

The lack of specific detail for making teas was perhaps of no consequence when the tea was used merely as an external vehicle as an aid to taking, say, an unpalatable tincture or powder. On the other hand, in many recipes the tea was intended as a contribution to therapeutic purpose. The following seven "simple" (single-ingredient) teas are commonly noted; they are given here along with the therapeutic property as listed in the de Benneville manuscript (spellings and terms are as in

Although there is no record that de Benneville used the Halle medications, his friend Dr. Abraham Wagner did. Above, eighteenth-century Halle pharmaceutical containers from the collection of the Francke Foundations. Many of the containers are exquisitely decorated with the Francke emblem. After the 1750s, the Halle pharmacy and the Medikamenten-Expedition contracted with the Prussian Royal Glassworks. Before that, they had used Bohemian and Thuringian glassblowers. (Photograph by Klaus E. Göltz, Halle, courtesy of the Franckesche Stiftungen)

original, but specific parts of plant are not given):

lavender	as a nervine and cephalic, or stimulant
fennel	carminative or diuretic
ground ivy	vulnerary
yarrow	astringent
bawn [balm]	hysteric or diaphoretic
flax seeds	balsamic, emollient
marjoram	nervine and cephalic
angelica	carminative
camomile	carminative
chervil	diuretic
cinquefoil	detergent
carduus	stomachic
cummin	carminative
heal-all [all-heal]	detergent
juniper berries	detergent
lig. sanctum [guaiacum]	absorbant or diaphoretic
marigold	diuretic
mugwort	hysteric
peony	nervine and cephalic
rosemary	nervine and cephalic
rue	hysteric
sassafras	absorbent
sarsaparilla	absorbent
scurvy grass	detergent
snakeroot	diaphoretic

Additionally, many other teas appear in one or more recipes. Included (with recommended uses from the manuscript) are:

Additionally, many teas were prepared from multiple herbs and up to a dozen or so other ingredients; many, in fact, were the very antithesis of simplicity and standardization.

Effectiveness

The de Benneville manuscript, as so many others of the period, has diverse, almost contradictory, features: indications of a concern with standardization, yet an eclecticism of theory and recipes. Certainly, de Benneville's Paracelsian interest is a complicating factor.

In closing, I return to the question about the effectiveness of past treatments. Nothing I have said supports that treatments were any more effective than commonly supposed by Estes and other historians. On the other hand, many of the modes of treatment—particularly the substantial range of medicinal agents made into simple and compounded preparations—have few, if any, parallels with today. For instance, the de Benneville recommendations to take a preparation in a tea with its own therapeutic properties prompt questions about how much synergistic activity between items of the materia medica was appreciated.

There was, too, during the century a clear belief that although contemporary treatments could be improved upon, they were not useless. Relief of symptoms, discussed earlier in this article, was a pervasive concern in the texts of the period, including de Benneville's. The phrases "for strengthening the stomach," and "a great restorative" implied a clinical way in which "therapeutic effectiveness" was often defined, both by professionals and lay people. Such a clinical approach to symptom relief could accommodate readily the ways in which an individual handled symptoms of an illness, including cultural characteristics. Perhaps that was more effective care in certain conditions than the results of what is often viewed as today's *pro forma* biological approach to managing illness. Many detailed studies are needed to examine that interpretation, however, and to consider the relevance of patients' attitudes to illness, the role of religious resignation or fatalism, and so on.[32]

Certainly the precise way dosage contributed to everyday management in the hands of different practitioners remains generally unresolved, even though many gave much thought and deliberation to it.

John Quincy's opening quotation to this article is somewhat surprising in so far as he was to the forefront in emphasizing a careful and thoughtful approach to making medicines. Yet his reference to the importance of knowing "How to give a Medicine" mirrored a key concern of eighteenth-century medicine.

♦

Notes

1. John Quincy, *Pharmacopoia Officinalis & Extemporanea; or, A Compleat English Dispensatory* (London: A. Bell, W. Taylor, and J. Osborn, 1719), vii.

2. K. Bone, "Dosage Considerations in Herbal Medicine," *British Journal of Phytotherapy* 3 (1993–1994): 128–37.

3. J. Worth Estes, "Changing Fashions in Therapeutics," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 11 (1995): 65–72, quotation from 66–67.

4. Ibid., 68–69.

5. The interest aroused by John M. Riddle, *Contraception and Abortion from the Ancient World to the Renaissance* (Cambridge: Harvard University

Press, 1992), for example, can be seen in Norman Gevitz and Micaela Sullivan-Fowler, "Making Sense of Therapeutics in Seventeenth-Century New England," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 11 (1995): 87–102. See also Riddle, "Everybody, the Historian, and the Scientist," *Pharmacy in History* 37 (1995): 159–64.

6. For an interesting example of a historian's drawing on medical anthropology to consider matters of efficacy in ancient medicine, see K. Nijhuis, "Greek Doctors and Roman Patients: A Medical Anthropological Approach," in *Ancient Medicine in Its Socio-Cultural Context,* ed. P. J. van der Eijk, H. F. J. Horstmanshoff, and P. H. Schrijvers, 2 vols. (Amsterdam: Rodopi, 1995), 2:49–67.

7. Early-eighteenth-century letters, single sheets, from a private manuscript collection.

8. As quoted in Neil C. Hultin, "The Testimony of Our Senses: William Heberden's Lectures upon Materia Medica of 1743," *Pharmacy in History* 32 (1990): 95–110.

9. Cleansing and other terms are readily found in eighteenth-century accounts of therapy. For some context to the theory, see Christa Habrich, "Characteristic Features of Eighteenth-Century Therapeutics in Germany," *Clio Medica* 22 (1991): 39–49; Johanna Geyer-Kordesch, "Georg Ernst Stahl's Radical Pietist Medicine and Its Influence on the German Enlightenment," in *The Medical Enlightenment of the Eighteenth Century,* ed. Andrew Cunningham and Roger French (Cambridge: Cambridge University Press, 1990), 67–87.

10. William Buchan, *Domestic Medicine; or, The Family Physician* (Philadelphia: Crukshank, 1774), 101.

11. For some background to standardization, see John K. Crellin and J. R. Scott, "Pharmaceutical History and Its Sources in the Wellcome Collections, III: Fluid Medicines, Prescription Reform and Posology, 1700–1900," *Medical History* 14 (1970): 132–53; for issues over weights, see Crellin and Scott, "Pharmaceutical History and Its Sources in the Wellcome Collections, II: Drug Weighing in Britain, c. 1700–1900," *Medical History* 13 (1969): 51–67. To that can be added such comments as "differences in weights have occasioned great confusion in the practice of pharmacy"; see William Lewis, *The Edinburgh New Dispensatory* (Philadelphia: Dobson, 1791), 91. Much can be written on the issue of chemistry and menstruums, but it is sufficient here to note that Robert Dossie stated in 1749 that a knowledge of menstrua and menstrual powers was a key not only to the improvement in pharmacy but also to the accurate preparation of medicines already in use; see his remarks in John Quincy, *Pharmacopoeia Officinalis & Extemporanea; or, A Compleat English Dispensatory* (London: T. Longman, 1749), 6. It is noteworthy, too, that more and more attention was paid to labeling of individual medicines; see Wolfgang-Hagen Hein and Dirk Arnold Wittop Koning, *Das Apotheken-Etikett* (Eschborn: Govi-Verlag, 1994).

12. For doses, see Crellin and Scott, "Fluid Medicines."

13. *Dr. Robert James's Powder for Fevers and All Inflammatory Disorders. Published by Virtue of His Majesty's Royal Letters Patent* (n.p., n.d.).

14. Ibid.

15. For medicine chests in general and comment on Halle doses, see Anne Mortimer Young, *Antique Medicine Chests; or, Glyster, Blister and Purge* (London: Vernier Press, 1994); for Halle chests, see ibid., 15–17.

16. Guenter B. Risse, "The History of Therapeutics," *Clio Medica* 22 (1991): 3–11.

17. See Edward Kremers, ed. and trans., "Coste's Compendium Pharmaceuticum," *Badger Pharmacist* 27–30 (1940): 7.

18. *British Pharmacopoeia* [1867, with additions made in 1874] (London: Spottiswoode, 1877), xiii.

19. William Barton, *Vegetable Materia Medica of the United States,* 2 vols. (Philadelphia: Carey and Son, 1817–1819), 1:119, 130, and 2:137.

20. Ibid., 1:217.

21. John Redman Coxe, *The American Dispensatory* (Philadelphia: Dobson, 1806) and later editions; Jacob Bigelow, *American Medical Botany* (Boston: Cummings and Hilliard, 1817–1820).

22. John Tennent, *Every Man His Own Doctor; or, The Poor Planter's Physician* (Philadelphia: Franklin, 1736), 33.

23. Barton, *Vegetable Materia Medica,* 2:60.

24. John Quincy, *Quincy's Lexicon Physico-Medicum Improved; or, A Dictionary of the Terms Employed in Medicine* (1719; rpt. New York: T. & J. Swords, 1802), 410,

25. John Ayrton Paris, *Pharmacologia* (London: S. Highley, 1843), 463.

26. Ibid., especially 455.

27. George de Benneville, *Medicina Pensylvania; or, The Pensylvania Physician*, manuscript, ca. 1770, College of Physicians, Philadelphia.

28. For proprietary medicines, see Andrew S. Berky, *Practitioner in Physick: A Biography of Abraham Wagner, 1717–1763* (Pennsburg, Pa.: Schwenkfelder Library, 1954); for teaspoons, see ibid., 115.

29. Cf. n. 9

30. J. K. Crellin and J. R. Scott, "Lionel Lockyer and His Pills," *Proceedings of the XXIII International Congress of the History of Medicine,* 2 vols. (London: Wellcome Institute of the History of Medicine, 1974), 2:1182–86.

31. Crellin and Scott, "Fluid Medicines."

32. How generalizable fatalism is to the public is very difficult to say and requires further study. The role of fatalism may contribute significantly to therapeutic outcomes, even in contemporary societies. According to Joan Lane: "From the evidence of diaries and correspondence, patients' responses to illness varied greatly, but a strongly fatalistic strand runs throughout much of this eighteenth century material, as well as a stoicism towards personal suffering almost incomprehensible to the modern reader." See Lane, 'The Doctor scolds me': The Diaries and Correspondence of Patients in Eighteenth Century England," in *Patients and Practitioners: Lay Perceptions of Medicine in Pre-Industrial Society,* ed. Roy Porter (Cambridge: Cambridge University Press, 1985), 205–48, quotation from 217.

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Illness and Therapy in Two Eighteenth-Century Physician Texts

Jacob Woodrow Savacool

We have few if any texts that permit linking early modern medical theory as developed at German universities or other medical settings to the actual practice of medicine in British North America. This article examines two approaches to eighteenth-century nosography and related therapy used in rural practice in the American colonial environment. One forms part of a large unpublished compendium that reflects both the author's eclectic medical orientation and his large experience as a dispensing practitioner; its exact pedigree is unknown.[1] The second approach originated in a European academic setting of the early eighteenth century and was known throughout Europe and beyond.[2]

The first text is the *Medicina Pensylvania; or The Pensylvania Physician* by George de Benneville (1703–1793), a colonial physician of considerable local reputation who practiced in eastern Pennsylvania and Philadelphia between 1741 and 1780. De Benneville's full and diverse pharmaceutical and therapeutic compendium, although not published, provides entry to the medical universe of a physician trained in central Europe who attempted to reconcile his training with a large medical and pharmaceutical practice in colonial North America. In addition to detailed and systematic advice on materia medica and pharmacy, the *Medicina* exhibits a strong Paracelsian influence combining astrological and spagyrical beliefs with medical practice, reminiscent of earlier patterns observed in New England by Patricia Watson.[3]

In this article, the de Benneville orientation can be compared with a more academic European work, a widely read Pietist self-help text by Christian Friedrich Richter, *Die Höchst-nöthige Erkenntnis vom Leibe und natürlichen Leben* (first published in 1708).[4] Both Richter and de Benneville practiced in a tradition of religious reform and chemiatric antecedents; Richter's work reflects the unique junction of Pietist dietetics and Halle academic medicine, in particular the teachings of Georg Ernst Stahl and Friedrich Hoffmann.[5] The Halle teachings were imported to North America by Lutheran Pietist ministers at roughly the same time as de Benneville's coming over in 1741.[6] Neither work has been fully discussed in terms of the therapeutic choices available to North American physicians at the end of the colonial period.

Both texts reflect the well-known diversity in medical approaches prior to the advent of modern pathology and etiology. Despite efforts during the seventeenth and eighteenth century to provide more rational and clinically relevant disease classifications, many practitioners

remained convinced that cure could not occur without treatment. Although the Hippocratic principle of the healing powers of nature was established from ancient times and despite the growth of expectant attitudes in some schools, therapeutic action remained the prerequisite to healing.[7]

Colonial North America was an essentially open medical market with a profusion of European traditions. Certain local plants already in the European armamentarium were harvested and cultured. Many practitioners anticipated profiting from the adoption of Indian remedies; such hopes remained largely unrealized, however, although a few native herbal remedies did survive later scrutiny.[8] There was some awareness of a need to classify (or reclassify) diseases, but there was little occasion or ability to enforce at least theoretical consensus, especially prior to the founding of the first medical school in 1765. Several focused efforts were made at the practical level, as reflected in the recording of causes of death at the Philadelphia dispensary and from office records of physicians. Historian J. Worth Estes has collected and prepared lists from experiences at the Philadelphia Dispensary that specify ills treated, outcomes, and causes of death. Collated by a committee utilizing William Cullen's nomenclature, they were arranged in ten categories and provide reasonably satisfactory estimates of the identity of the conditions listed, although many are still symptoms or physical signs.[9] Estes's tabulation of causes of death recorded in five municipalities in New England also reveals some trend toward uniformity, which roughly reflects disease prevalence and identity.[10]

George de Benneville's *Medicina Pensylvania*

De Benneville's nosographies clearly draw on an earlier tradition. In terms of disease classification and to some extent in therapeutics, he brings together a number of early modern schemes, most notably relatively undiluted Paracelsian concepts of etiology.[11]

Although we have only disparate evidence on the course and the models of his European medical training, the most reasonable inference from an informal autobiography, contextual German sources, and his own brief account in the *Medicina Pensylvania* is that de Benneville had studied medicine in Germany, apparently in circles close to the radical Pietist physicians at the court of Sayn-Wittgenstein, and had practiced for a brief period in Belgium. The son of Huguenot refugees to England, de Benneville had undergone a spiritual and millenarian conversion at a young age; he was expelled from the London Huguenot community, went to France, and was eventually imprisoned there.

After his release from prison, he travelled in Germany and had close contact with Inspirationalist circles, including a group around Johann Philipp Kämpf (1688–1753), a respected hospital and rural physician who had been forced to leave Zweibrücken in 1736. Kämpf later practiced in Bad Homburg and taught in a setting dominated by radical Pietist physicans, including Johann Samuel Carl (1677–1757) and the noted Paracelsian Johann Conrad Dippel (1673–1734).[12] De Benneville emigrated to North America in 1741 and was received by the strongly Inspirationalist circle around Christopher Sauer. De Benneville first developed his

practice in Oley Township, Berks County, Pennsylvania. In 1755 he relocated to the Philadelphia area, where his family became prominent and prosperous, a pharmacy being added to their enterprises.

In the rural regions adjacent to Philadelphia, numerous medical providers with and without European medical training practiced in a rich and highly pluralistic mixture of religious and cultural groups. De Benneville's prolific medical and clerical colleagues in the Oley region apparently shared many of his radical religious tenets, again reminiscent of the New England physician clergy described by Watson. As early as 1740, Abraham Wagner, a Schwenkfelder physician from Silesia and a neighbor of de Benneville's, had developed a primitive but workable nosology based mainly on anatomical sites and symptoms; Wagner listed nine classes.[13]

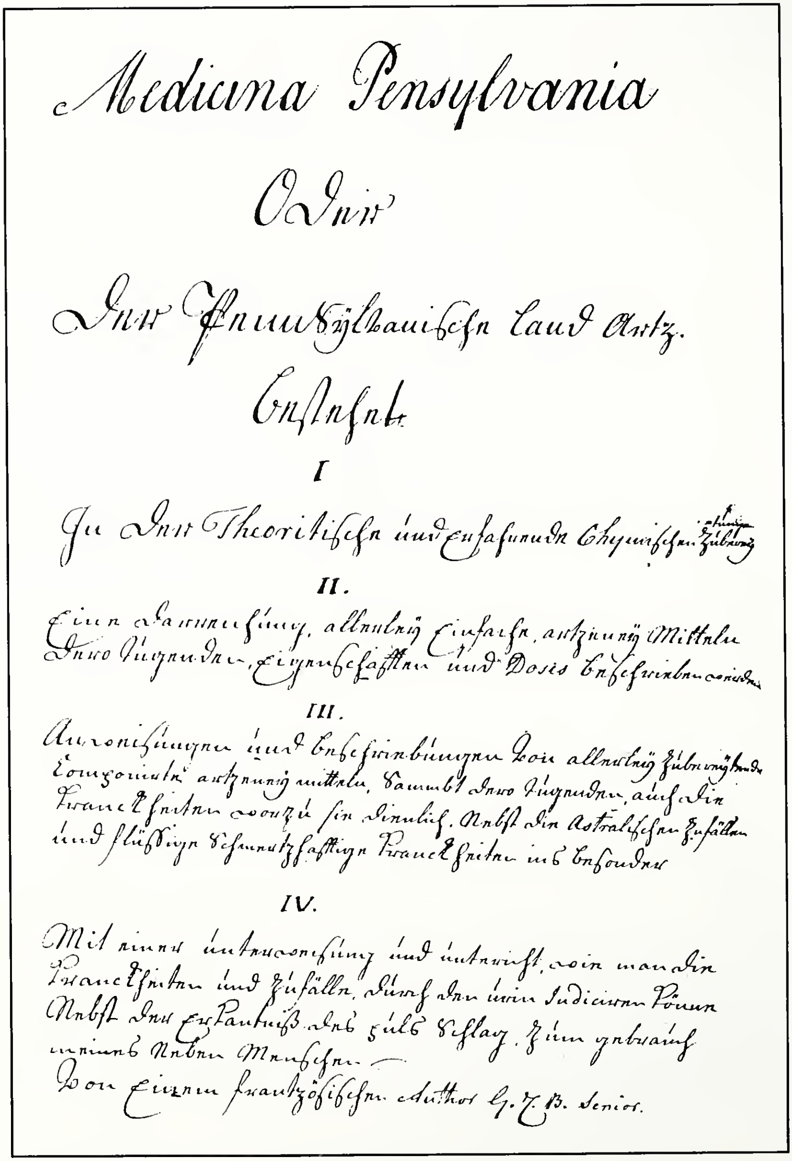
The *Medicina Pensylvania* was written in German and English with Latin nomenclature (see page 54), reflecting the multilingual audience and practice of its author.[14] The title page indicates its four parts. The English verso page reads:

> I. The Theory and Practice of Pharmacy
> II. A Distribution of Medicinal Simples, According to Their Virtues and Sensible qualities
> III. Directions for Extemporaneous Prescriptions, with a Select Number of Elegant Forms with the Astralis, and Other Diseases in General
> IV. With a [*sic*] Instruction, How to Judge the Diseases by the Urine, and the Knowledge of the Pulse Beating, for the Use of Mankind.

De Benneville's formal disease classifications were restricted to the astrological table of disease "creations" and the Latin listing of "conditions." The latter, which provides a framework for treatment, employed mainly signs and symptoms. No etiology was suggested except causes attributed to the planets. "Tartars" were held responsible for illness by settling in dry parts of the body, sticking in the entrails, obstructing the liver, causing "catarrhs," or settling in the heart, the blood, or elsewhere. The *Medicina* is sparse in its explanation of how the planets carry out their deleterious and implicitly purposeful effects, but the likelihood is that de Benneville was simply reproducing that schema from memory or notes, surrounding it with an extensive body of therapeutic information based on traditional and available materia medica.[15]

The large, fifty-one-page introductory portion listed the types of medications to be described in greater detail, divided into substances of vegetable, animal, and mineral origin. This was followed by a table of apothecaries' weights and then a long version of the medications, classified by the conditions for which they could be used. Next was a section titled "Simple Preparations," followed by salt and saline ones, which indicated chemiatric as well as metallic agents. Suggesting his ongoing pharmaceutical and dispensing practice, de Benneville also dealt with methods for the concoction of such substances as conserves, decoctions, powders, oils, extracts, and the like. Many of the medicines were advised to be administered with certain herbal preparations, frequently a particular tea. (For additional detail on those teas, see John Crellin's "How Shall I Take My Medicine? Dosages and Other Matters in Eighteenth-Century Medicine" in this issue.) Although de

German title page of George de Benneville's Medicina Pensylvania. *All images from that title are reprinted through the courtesy of the College of Physicians, Philadelphia.*



Medicina Pensylvania

Oder

Der Pennsylvanische Land Artzt.

Bestehet

I

In der Theoritischen und erfahrenden Chymischen Zubereitung

II.

Einer Anweisung, allerley Einfache, artzney Mittlen der Tugenden, Eigenschaften und Dosis beschrieben werden

III.

Anweisungen und beschreibungen von allerley zubereiteten Compositen artzney mittlen, sambt der Tugenden, auch die Kranckheiten wozu sie dienlich. Nebst die Astralischen Zufällen und flüssigen schmertzhaftigen Kranckheiten ins besondere

IV.

Mit einer unterweisung und unterricht, wie man die Kranckheiten und Zufälle, durch den urin Judiciren könne Nebst der Erkantnuß des puls schlag. Zum gebrauch meines Neben Menschen —

Von Einem frantzösischen Author G. D. B. Senior.

Benneville alphabetized some types of preparations in Part I, he imposed no consistent arrangement of entries.

Part II, "A Distribution of Medicinal Simples," described methods of preparation and uses of pills, plasters, ointments, clysters (enemas), suppositories, baths, poultices, gargles, and even a nuptial aphrodisiac. Throughout the entire section, methods of pharmaceutical preparation were described in detail, possibly to guide readers in managing their own pharmacy needs (providing they possessed some basic equipment and the necessary inventory of crude drugs). Many preparations did involve simple procedures with only a few substances, but others were complicated and quite demanding, e.g., the pulvis panacea, which, with a few carefully noted exceptions, was recommended throughout.[16]

De Benneville made few references to bleeding or other invasive or mechanical procedures,[17] but he did have an interesting reference to "Sataceum," which was described as the placement of a hemp thread through the skin of the neck (which by drawing the thread "now and then" permitted the humors to be drawn from the head and eyes). That procedure is among the few instances in the *Medicina* where an invasive procedure is described apart from the traditional Galenic armamentarium for removing or manipulating the humors—purging, emesis, diaphoresis, and diuresis. Although bleeding was not excluded by Pietist physicians of the more radical orientation, heroic use was generally frowned upon. De Benneville specified neither the site for venesection nor the volume to be extracted.

De Benneville's "Table of Diseases Divided in Three Parts with the Principles Adapted to Each" (see page 56) reflected a strong and, in some respects, an orthodox Paracelsian orientation to astrology and mechanisms of disease creation. Side by side with the Paracelsian doctrine of the tartars were explanations by Galenical humors (blood, black bile, yellow bile, and phlegm), the ancient elements (earth, air, fire, and water), and the quaternary descriptions of heat, cold, moisture, and dryness. De Benneville thus exemplifies the eclecticism of the early modern practical physician.

Various more-or-less specific methods of treatment were listed under "Astralis Diseases." Many herbal medications were listed, usually to be administered in teas from garden plants. The precaution: "Care must be taken not to Purge or Bleed as it will endanger the patient's life" was not specific but probably applies to diseases presumably of astral origin. The caution was repeated once in the same section.

"Part 2nd. Of Astralis or Astrabol. Tartarous Diseases" begins with a detailed and comprehensive description of the tartars (see page 58). Its length is unusual for the treatment encountered in most contemporary works, which tended to reflect the influence of such recent iatrochemical writers as Jean Baptiste van Helmont (1577–1644), who rejected both the tartar theories of Paracelsus and the Galenic humor schemes.[18]

Tartars had been described since antiquity, although their role in disease was limited to stone formation from such exogenous sources as milk and cheese. Paracelsus expanded that concept to much broader disease causation, including faulty digestion and organ pathology.[19] It was assumed that tartars could be produced in the lungs (causing lung stones) and in the kidneys, where disease could be diagnosed

De Benneville's "Table of Diseases Divided In Three Parts With the Principles Adapted To Each"

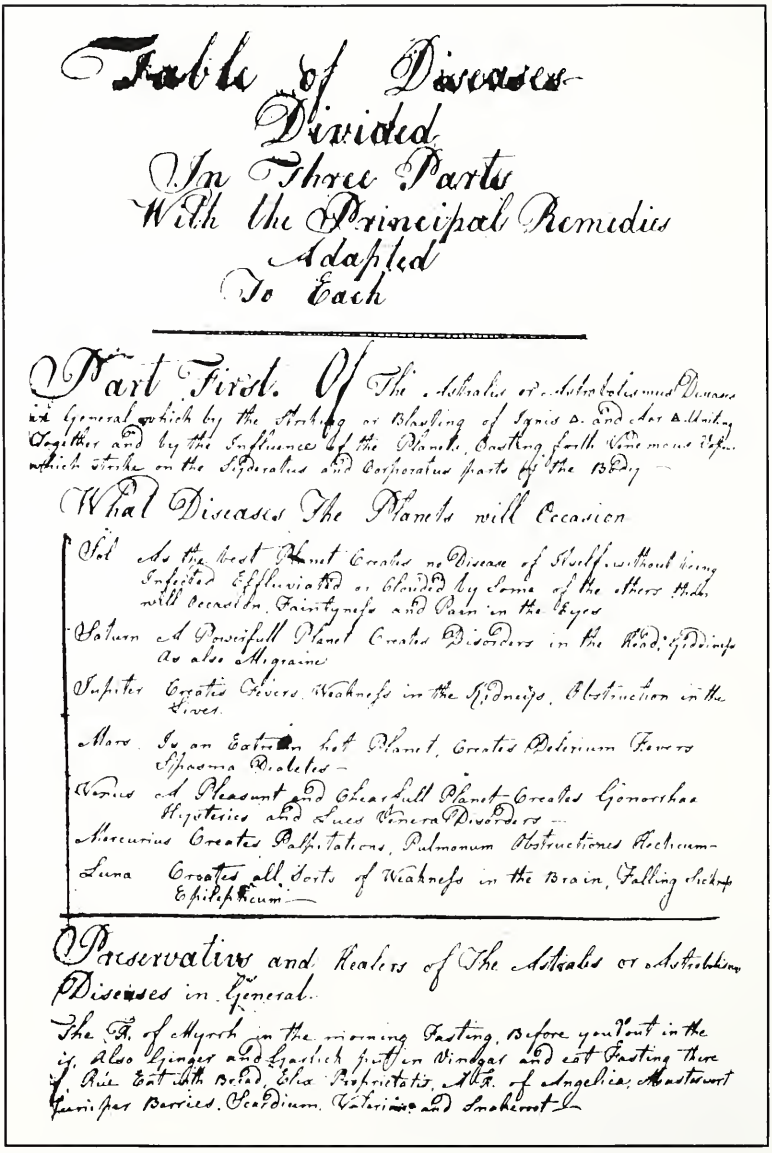


Table of Diseases
Divided
In Three Parts
With the Principal Remedies
Adapted
To Each

Part First. Of The Astrales or Astrobolismus Diseases in General which by the Striking or Blasting of Ignis D. and Aer A. Mixing Together and by the Influence of the Planets, Emitting forth Some means Effluvia which Strike on the Siderales and Corporales parts of the Body —

What Diseases The Planets will Occasion

Sol As the Heart Planet Creates no Disease of Skull &c without being Infected Effluviated or Clouded by Some of the Others Malignity will Occasion Faintyness and Pain in the Eyes

Saturn A Powerfull Planet Creates Disorders in the Head & Giddiness As also Migraine

Jupiter Creates Fevers Weakness in the Kidneys, Obstruction in the Lives

Mars Is an Extream hot Planet, Creates Delerium Fevers Spasma Diolates —

Venus A Pleasant and Chearfull Planet Creates Gonorrhae Hysteries and Lues Venera Disorders —

Mercurius Creates Palpitations, Pulmonum Obstructiones Rachium —

Luna Creates all Sorts of Weakness in the Brain, Falling Sickness Epilepticum —

Preservative and Healers of The Astrales or Astrobolismus Diseases in General.

The R. of Myrrh in the morning Fasting, Before you Eat in the if, Also Ginger and Garlick put in Vindgar and eat Fasting three R. Eat with Bread, Elix Proprietatis, Alla. of Angelica, Masterwort Juniper Berries, Scordium, Valerian and Snakeroot &

by "tartaric" deposits in the urine (hypostasis). Tartars could also be produced in the nose (the so-called "stomach of the brain"), where excreted tartars caused insanity. Paracelsus interpreted the process as a local morbid anatomical change "in which the invisible action of the pathogenic agent and the invisible failure of local digestive faculties become visible and lend themselves to investigation in the processes of coagulation, obstruction of channels and stone formation which they have caused."[20] Paracelsus expanded the concept of digestion by assigning a role to acid, but he appears to have limited that to an abnormal function. He was aware of the biological power of acids by his observation of the deposition of albumen in urine by the action of acid, and his conclusions regarding tartaric disease were singled out by Walter Pagel as a major aspect of his "nosologic theories . . . (which) applies all that is essential in his reform of pathology."[21]

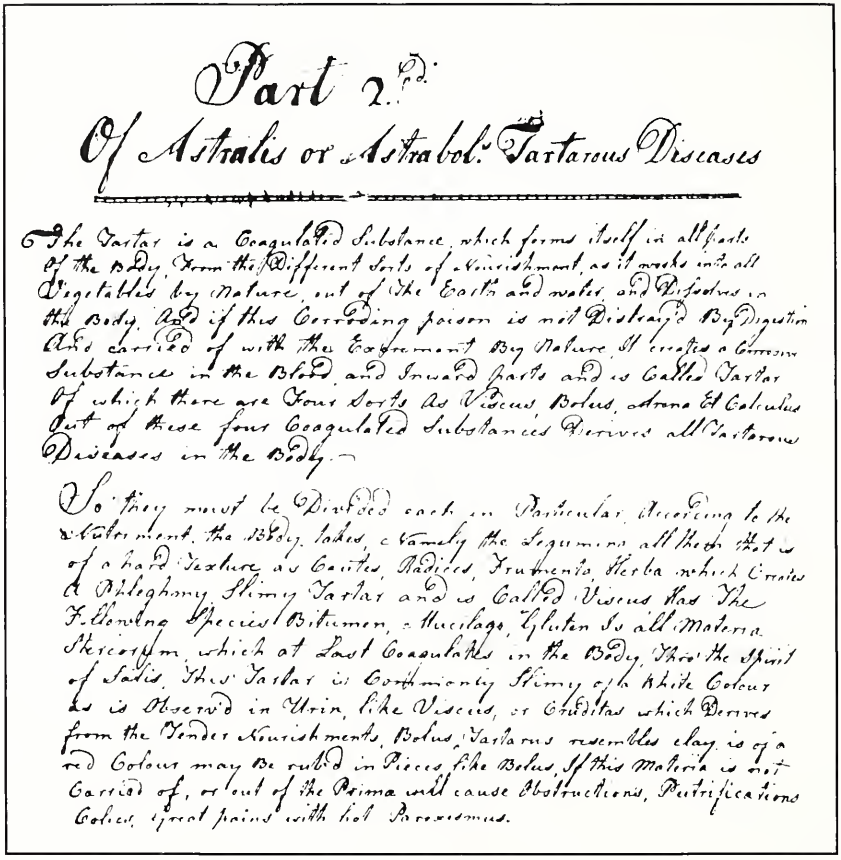
"Tartarous Diseases" defined tartars and described de Benneville's understanding of their formation and their threats to the various parts of the body and symptoms from localization. But there was no corresponding and explicit description of Galenic schema, leading us to believe that whatever the pedigree of the author's knowledge and sources, he considered tartars a major cause of disease.

Part III begins with a lengthy list of "diseases," again arranged in Latin alphabetical order, the first relating to abortion. It is worth noting that while de Benneville did not limit tartars to the illnesses of Part II, he did consistently associate the humors with the diseases of Part III. Most of his treatment programs drew on the herbal tradition, often in balance with chemical medications. He infrequently prescribed such polypharmaceuticals as mithridate, alexipharmica, and theriaca, although he did advise them in previous sections.

The entry on "Preventing Abortion" (see page 60) illustrates some of those aspects. It should be noted that the recommended balsam was made up from numerous herbs (many of which were also employed for other purposes in the volume) and that none was identified as having specific properties for preserving pregnancy. The application of a "Myrrh Plaister on the Small of the Back and under the Navel" was comparable to the use of poultices or other medications applied externally on a cloth soaked with drugs for various ills.

The employment of herbs for preventing or inducing abortion has a long, complex, and intriguing medical history, which at least in practice transcended religious and sectarian boundaries.[22] The agents considered to prevent abortion consisted mainly of herbs believed to be nonirritants, and those were commonly used, as were the herbs in de Benneville's antiabortion balsam. None of the ingredients of that balsam (nor those advised for making teas) had any enduring specific effects as antiabortifacients, however, and the *Medicina* provides no explicit guidance as to the author's actual practice in the use of agents either to promote or to prevent abortion or miscarriage.

The section continues with a highly detailed list of conditions for which some mode of treatment was advised. Those conditions were largely symptoms, but some denoted established clinical processes, e.g. anasarca, quincey (quinsy), asthma, rheumatism, diabetes, and St. Anthony's fire (erysipelas). A number of treatments were picturesque or bizarre, but most were based upon herbal agents and



Part 2.d

Of Astralis or Astrabol. Tartarous Diseases

The Tartar is a Coagulated Substance, which forms itself in all parts of the Body, from the Different Sorts of Nourishment, as it works into all Vegetables by Nature, out of the Earth and water, and Disorders in the Body. And if this Corroding poison is not Distroyed By Digestion And carried off with the Excrement By Nature, It creates a Common Substance in the Blood and Inward parts and is Called Tartar Of which there are Four Sorts As Viscous, Bolus, Arena Et Calculus Out of these four Coagulated Substances Derives all Tartarous Diseases in the Body.

So they must be Divided each in Particular, According to the Nourishment, the Body takes, namely the Legumina all Herbs that is of a hard Texture as Carites, Radices, Frutmenta, Herba which Creates A Phlegmy, Slimy Tartar and is Called Viscous Has The Following Species Bitumen, Mucilago, Gluten Is all Materia Sterconsum, which at Last Coagulates in the Body, Thro' the Spirit of Salis. This Tartar is Commonly Slimy of a White Colour As is Observed in Urin, like Viscous, or Crudities which Derives from the Tender Nourishments, Bolus Tartarus resembles clay is of a red Colour may Be rubbed in Pieces like Bolus, If this Materia is not Carried off, or out of the Prima will cause Obstructions, Putrifications Colics, great pains with hot Paroxismus.

De Benneville described the tartar as "a Coagulated Substance which forms itself in all parts of the Body."

some mercurials. Many began with the dictum "purge with Laxative and Panacea." For some "diseases" a quite advanced treatment was advised—such as the orders for empyema, for example. Treatment of "An Imposthuma or a Collection of Purulent Mat(t)er in the Cavity of the Breast [chest]" included the usual herbs, but de Benneville added instructions to drain the cavity and, if necessary, keep open the wound with a tube or canula through which irrigation might be added. Incision of the cavity was proscribed, however, if "the Patient is Grown Very Weak and the Lungs already Seized with a Putrifaction [*sic*]." While empyema—including spontaneous rupture (*empyema necessitatis*)—has been described since Hippocrates,[23] that level of surgical sophistication is unexpected in early eighteenth-century North America.

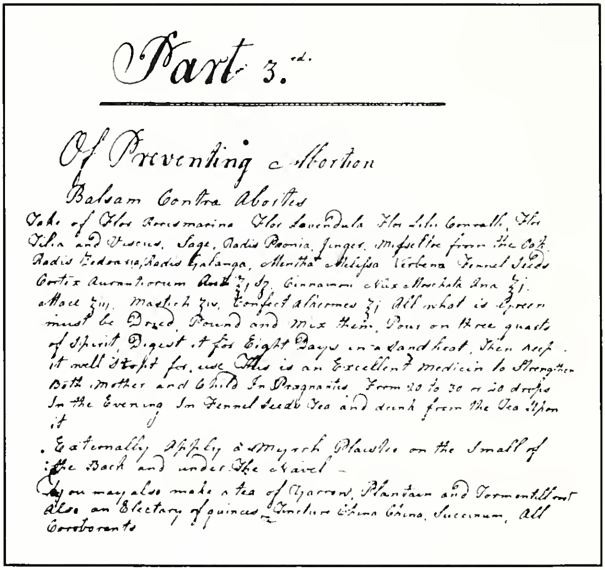
For nervous or mental problems, the prescribed medications included hellebore, elecampane, hypochondri, camphor, Tr. Nervina, carduus, opium, and others. Treatment recommendations for "the yellow Jaundice" matched the color of the illness with that of the medicine—saffron, marigold flowers, or celandine. Treatment of the various forms of edema included both diuretic and diaphoretic principles. *Tr. Antimonii*, theriacalis, and balsamus vita in tea of snakeroot and camomile were among the remedies commonly employed with instructions to "keep the patient in a gentle sweat."

As common during the period, lues veneria received comprehensive attention. The treatment program was apparently intended for both syphilis and gonorrhea. Instructions were to begin with panacea and laxative, followed by an additional ten grains of calomel. Although mercurials dominated the medications, *Tr. Antimonii*, scorbutic, antivenerium, balsam Peru, polychrestum, capivi, and astringent were all employed, given in an herbal tea. Bleeding in the amount of "8 ounces of blood in the right arm" was advised for the following day "if the patient's strength will admit"—the only instance in which de Benneville specified the location from which the blood was to be drawn. A decoction of various seeds boiled in barley water was added.

External treatment included bathing the genitals with a lotion made by boiling "camomile in milk with a little sugar candy" and injecting some into the yard (penis) or female genitalia. Treatment continued with many herbals and chemical agents, especially mercury; until symptoms improved, bleeding and local treatments to genital regions were to be repeated. Dietary restrictions were intended to keep the bowels "in a moderate Lax." Further instructions related to side effects, including treatment of mercury poisoning, mainly "salivation and spitting," with a laxative decoction of senna and rhubarb or elecampane and rhubarb.

De Benneville appended a "Guide for Women's and Children's Diseases in Particular," similar to those found in many early-eighteenth-century texts. He included directions for management of complications of labor and delivery, including the appropriate use and timing of certain herbal teas. Management of abnormal newborns, miscarriages, "Women's Longings," postnatal care, and other maternal problems were discussed. Cinnamon, prescribed in several forms, appeared as a "womb strengthener."

Part IV, the last major segment of the *Medicina*, was not explicitly related to the section on tartars but comprised its Paracelsian complement, a lengthy treatise



Part 3.rd

Of Preventing Abortion

Balsam Contra Abortes

Take of Flos Rorismarine Flos Lavendula Flos Lilii Convall. Flos Tilia and Viscus, Sage, Radix Paeonia, Ginger, Misseltoe from the Oak Radix Zedoaria, Radix Galanga, Mentha, Melissa Verbena Fennel Seeds Cortex Aurantiorum Ana ℥i ʒ, Cinnamon Nux Moschata Ana ℥i. Mace ʒiij. Mastick ʒiv, Confect Alkermes ℥i All what is Green must be Dryed, Pound and mix them, Pour on three quarts of Spirit, Digest it for Eight Days in a Sand heat, Then keep it well Stopt for use This is an Excellent medicin to Strengthen Both mother and Child In Pregnancies From 20 to 30 or 40 drops In the Evening In Fennel Seeds Tea and drink from the Tea upon it

Externally Apply a Myrrh Plaster on the Small of the Back and under the Navel –

You may also make a tea of Yarrow, Plantain and Tormentill root Also an Electary of quinces, Tinctura China China, Succinum, All Corroborants

German and English passages on "Preventing Abortion"

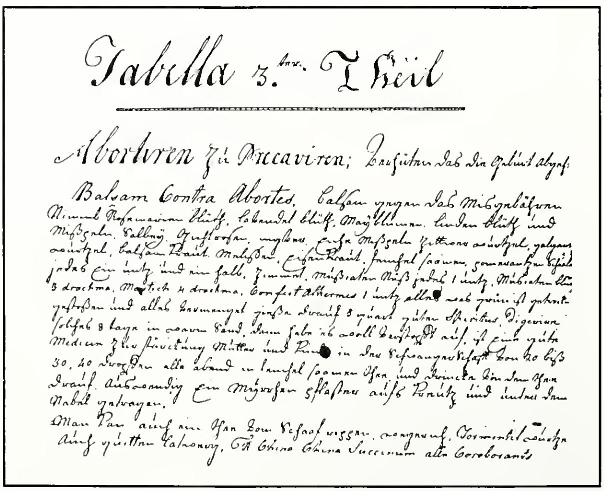


Tabella 3.tius Theil

Abortiren zu Precaviren; Verhüten das die Geburt abgehe

Balsam Contra Abortes, Balsam gegen das Misgebähren

Nimmt Rosmarien blüth, Lavendel blüth, Maÿblumen, linden blüth und Mistel, Salbeÿ, Gichtrosen wurtzel, Ingber, Mistel von Eichen, Zittwer wurtzel, galgan wurtzel, Balsam kraut, Melissen, Eisenkraut, fenchel saamen, pomeranzen schale jedes ein untz und ein halb, Zimmet, Muscaten Nüß jedes 1 untz, Muscaten blüt 3 drachma, Mastich 4 drachma, Confect Alkermes 1 untz alles was grün ist getrocknet gestoßen und alles vermengt giesse darauf 3 quart guten Spiritus, Digeriren solches 8 tage in warm Sand, dann habe es wohl verstopft auf. ist eine gute Medicin zur stärkung Mutter und Kind in der Schwangerschaft von 20 biß 30, 40 tropfen alle abend in fenchel saamen Thee und trincke von dem Thee darauf. äusserlich ein Myrrhen pflaster aufs Kreutz und unter den Nabel getragen.

Man kan auch ein Thee von Schaafgarben, Wegerich, Tormentil wurtzel auch quitten Latwerg, Tinct China China Succinum alle Corroborantia

on uroscopy.[24] It contained astrological references as well frequent mentions of tartars. Bleeding was discouraged, as was purging, especially when "Poisonous Humours Infect . . . Then it is Danger of Life to do it," a caution de Benneville previously expressed under treatment of astralis diseases.

In accordance with the practice of Paracelsus and his followers (in particular Leonhard Thurneysser, 1530?–1596)[25] de Benneville emphasized the importance of describing all possible details of the behavior of urine in a container. The specimen was "dissected" as to upper or lower portions, the sediment, the contents (including "everything that is to be seen"), the deposits on the walls of the container, the character of the froth or scum, and bubbles and grains—all of which relate to the part of the body that the various features represent. Color and odor also reveal the nature of the tartars and their significance. A "Tabella" apparently represented the author's understanding of urine findings as indicators of diseases both according to Paracelsian chemistry and other early-modern schemes, including the Galenical humors, the four elements, the seven courses of the Syderishes Spirits, the four complexions, and their hot, cold, dry, and moist relationships. Of them he observed, "These All Together Occasions Naturally Sicknesses." He then related the behavior of the tartars by source—stomach, liver, or kidney digestion—and the manner in which each can be effectively managed for good health.

While we do not know if de Benneville's efforts at synthesis in a description of disease causation are entirely original, it is clear that his text differs from other contemporary writings in its emphasis on the tartars and its attempt to provide, however tentative, a recognizable theoretical structure beyond a detailed materia medica and clinical guide. No similar emphasis has been encountered in colonial medical writings.[26]

Christian Friedrich Richter's *Die Höchst-nöthige Erkenntnis* and Its Nosography

A different approach is found in a more formal and widely accessible German text with a well-documented European provenance, *Die Höchst-nöthige Erkenntnis* by Christian Friedrich Richter (1676–1711). First published in 1708, the book is organized along the lines of a traditional medical text. In contrast to de Benneville's orientation as a dipensing apothecary or pharmacist, Richter instead offered to the physician and the learned lay user a range of prepared medicines for many therapeutic indications. Both the text and medications were imported through clergy associated with the publisher, the Halle Orphanage Foundations, and used in many German language communities of colonial North America, as described elsewhere in this issue.

Comparison with de Benneville's compendium therefore serves well to illustrate the range of professional medical writings available to German language and similarly inclined practitioners and the lay public. Reflecting their close ties to a major European medical school (the Friedrich University at Halle), both Richter and his subsequent editor, David Samuel von Madai, provided a classification of diseases far more in line with academic practice than the *Medicina*. Chapter IV of Part 2 includes an elaborate listing of clinical events under thirteen paragraph headings, the first stating the different names of the illnesses determined by their causes and actions to counter them.

Among the headings are failure of blood flow, retained "gall," retained mucus, diseases of "salty, phlegmy humidity," failure to expel or evacuate impurities, fevers, inflammations, ills relating to spasms or convulsions, and others; each heading is followed by a number of names, many of which were either symptoms or Latin terms for the illnesses. Richter's classification is at once more consistent in organization than de Benneville's and reflects a more empirical and clinical basis in physiology and pathology.

Richter lists diseases and afflictions in Latin and German, outlined under German paragraph headings; describes symptoms, signs, and some pathological designations of disease, e.g. cirrhosis, nephritis, and ulcer in the lungs. From the viewpoint of an academic exercise, the format is readily understood for planning treatment. Headings are based mainly upon humoral concepts but also include fevers, inflammations, diseases "named according to the circumstances," retention of gall, retention of phlegm, spasms, bleeding disorders, conditions relating to weakness, mood swings or bad dispositions, and conditions of unknown causes, obstructions, and instances in which "nature itself has become insane."

From the viewpoint of practical treatment, Richter's planned protocols provide explicit instructions for therapeutic indications, dosage, and patient age. The "cookbook" style of the *Höchst-nöthige Erkenntnis* makes it ideal (as stated in the preface) for use "on journeys and military campaigns and in the household" when no physician is available.

Both the similarities and contrasts of the de Benneville manuscript and the Richter text are intriguing. *Medicina Pensyslvania* represents a persistent but slowly receding Paracelsian tradition, which reflected the author's training in a radical Pietist medical setting and his own and his American colleagues' involvement with dissenting traditions. It also reflects a longstanding and conscious rejection of classic academic traditions. De Benneville shared those attitudes with such ethically and educationally radical physicians as Johann Samuel Carl, body physician to the King of Denmark from 1735 to 1742, and Johann Juncker, the director of the Halle medical institutions; both were prolific authors and advocates of modern therapeutic texts. Neither Carl nor Juncker, however, stood openly in the chemiatric tradition, and the strong Paracelsian aspects of de Benneville's physiological understanding are more reminiscent of Johann Conrad Dippel, and quite in contrast to the academic orientation of the Richter volume to Hoffmann and Stahl. All, however, share a significant if not always consistent bias against polypharmacy and place little emphasis on the animal and human components of the *Dreckapotheke* of an earlier period, although de Benneville still lists vipers, goose dung, goat horn and elk hooves as remedies against hysteria. His excursion on the tartars and his description of their mechanism of operation are quite in contrast with their absence in Richter. It is, however, possible that the term *acrimony*, which is encountered in both texts, has a connotation reminiscent of the tartars but without their Paracelsian associations. Defined as sharpness or acerbity, acrimony could readily relate to indications for the Richter *pulvis contra acredinem* in a manner comparable to but less specifically focused on the phenomenon of the tartars.[27]

Notably, despite several sections dealing with the origin and manifestations of

disease, there is no Richter counterpart to uroscopy, so important in de Benneville's diagnostic scheme. At the core of his nosography (if not his therapy), de Benneville appears to have adopted much Paracelsian teaching unquestioningly and, as noted by Müller-Jahncke, without displaying any of the influence of van Helmont.[28] But de Benneville was a practical, or dispensing, physician and as such gave equal room to a large and traditional materia medica, with specific indications for preparation and use. He was not above some imitation, even of the Richter preparations.[29]

Practicing physicians and other medical providers of the colonial period may have brought over traditional and evolving medical and pharmaceutical concepts whose influence was deflected in day-to-day practice. In that, they were not altogether different from their learned academic European colleagues, who knew well how to separate medical theory from medical practice.

Despite their differences in theory and structure, both Richter—in his detailed rationale for the use of Halle Orphanage Foundations medications—and de Benneville—in his caveats and preferences for certain therapies—indicate a relative preference for nonheroic treatments and a cautious approach to dosages and side effects. Whether those practices amounted to the more gentle medicine claimed for Pietist and other dissident physicians[30] is yet another issue for comparative analysis. The actual use of the precepts and instructions of each practitioner remain to be documented and integrated into a comparative approach to medicine in colonial North America.

♦

Notes

1. George de Benneville, *Medicina Pensylvania or, The Pensylvania Physician,* manuscript, ca. 1770, College of Physicians, Philadelphia. We thank Thomas Horrocks, director of the Rare Book Section of the College, for placing this manuscript and other sources at our disposal. The manuscript is 187 pages, numbered in duplicate pages to page 148; the last thirty-nine (probably added by one of de Benneville's sons) clearly differ from the main text in format and content, resembling a chapbook or commonplace book and running into the 1830s. For a brief discussion of the manuscript and its author in the context of early modern medicine, see Wolf-Dieter Müller-Jahncke, "Die Medicina Pensylvania des George de Benneville," *Dixhuitieme: Zur Geschichte von Medizin und Naturwissenschaften im 18. Jahrhundert,* ed. Arina Völker (Halle: Martin Luther Universität, 1988).

2. For the period and the European medical context, see Friedrich Hoffmann, *Fundamenta Medicinae,* trans. and ed. Lester S. King (New York: American Elsevier, 1971); for a chronology of transitions beginning in the sixteenth century, see Jerome J. Bylebyl, "Teaching Methodus Medendi in the Renaissance," in *Galen's Method of Healing: Proceedings of the 1982 Galen Symposium,* ed. Fridolf Kudlien and Richard J. Durling (Leiden: E. J. Brill, 1991), 157–89.

3. Patricia A. Watson, *The Angelical Conjunction: The Preacher-Physicians of Colonial New England* (Knoxville: University of Tennessee Press, 1991). For the continental European background, see in particular Wolf-Dieter Müller-Jahncke, *Astrologisch-magische Theorie und Praxis in der Heilkunde der frühen Neuzeit* (Stuttgart: Steiner Verlag Wiesbaden, 1985), 124–34, and Charles Webster, "Alchemical and Paracelsian Medicine," in *Health, Medicine and Mortality in the Sixteenth Century,* ed. Webster (Cambridge: Cambridge University Press, 1979), 312–15.

4. This article has used the following two versions of Richter's work: Christian Friedrich Richter, *Höchst-nöthige Erkenntnis vom Leibe und Natürlichen Leben* (Leipzig: J. F. Gleditsch, 1741) and David Samuel von Madai, *A Short Account of the Effects and Use of Some Approved Medicines Which Are Dispensed in the Orphanhouse at Halle* (Halle: Orphanhouse, 1784). See also Eckhard Altmann,

Christian Friedrich Richter: Arzt, Apotheker und Liederdichter der Halleschen Pietisten (Witten: Luther Verlag, 1972).

5. Johanna Geyer-Kordesch, "Georg Ernst Stahl's Radical Pietist Medicine and Its Influence on the German Enlightenment" and Roger French, "Sickness and the Soul: Stahl, Hoffmann, and Sauvages on Medical Pathology," both in *The Medical Enlightenment of the Eighteenth Century,* ed. Andrew Cunningham and Roger French (Cambridge: Cambridge University Press, 1990); Lester S. King, "Stahl and Hoffmann: A Study in Eighteenth Century Animism," *Journal of the History of Medicine and Allied Sciences* 19 (1964): 118–30; Jürgen Konert, "Academic and Practical Medicine in Halle During the Era of Stahl, Hoffmann, and Juncker," in this issue. For Paracelsian thought and social and religious reform, see Charles Webster, "Paracelsus, Medicine as Popular Protest," in *Medicine and the Reformation,* ed. Ole Peter Grell and Andrew Cunningham (London: Routledge, 1993), 57–77; for the general rejection of Paracelsian thought—but not of astrology in medicine—among the orthodox Lutheran clergy dominating Lutheran universities of the period, see Jole Shackelford, "Rosicrucianism, Lutheran Orthodoxy, and the Rejection of Paracelsianism in Early Seventeenth-Century Denmark," *Bulletin of the History of Medicine* 70 (1996): 181–204.

6. Renate Wilson and Hans Joachim Poeckern, "A Continental System of Medical Care in Colonial Georgia," *Medizin, Gesellschaft und Geschichte: Jahrbuch des Instituts für Geschichte der Medizin der Robert Bosch Stiftung* 9 (1992): 99–126.

7. J. Worth Estes, "Changing Fashions in Therapeutics," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 11 (Autumn 1995): 65–72. Although many (even in the colonies) affirmed the classical belief in natural cure, Benjamin Rush was a strong proponent (but not the only one) of the view that nature acted capriciously; others as well taught the necessity to treat for interruption of the progress of disease. See Nathaniel Chapman, *A Compendium of Lectures on the Theory and Practice of Medicine,* ed. Nathan Dow Benedict (Philadelphia: Lea & Blanchard, 1846).

8. David L. Cowen, "The Impact of the Materia Medica of the North American Indians on Professional Practice," in *Botanical Drugs of the Americas in the Old and New Worlds,* ed. Wolfgang-Hagen Hein (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1984).

9. J. Worth Estes, "Therapeutic Practice in Colonial New England," in *Medicine in Colonial Massachusetts, 1620–1820: A Conference Held 25 and 26 May 1978* (Boston: Colonial Society of Massachusetts, 1980; distributed by University of Virginia Press), Table XV.

10. J. Worth Estes, "Patterns of Drug Usage in Colonial America," *New York State Journal of Medicine* 87 (January 1987): 37–45.

11. Paracelsus [Theophrastus von Hohenheim], *Theophrast von Hohenheim gen. Paracelsus Sämtliche Werke: Medizinische und Naturwissenschaftliche und Philosophische Schriften, Abt. 1: Das Sechste Buch in der Arznei, von den Tartarischen oder Steinkrankheiten samt deren Heilung,* ed. Karl Sudhoff, Vol. 2 (Munich: R. Oldenbourg, 1930). The classic English-language studies on Paracelsian medical theory and its reception in European medical communities remain Walter Pagel, *Paracelsus: An Introduction to Philosophical Medicine in the Era of the Renaissance* (New York: S. Karger, 1958) and Allen G. Debus, *The English Paracelsians* (London: Oldbourne, 1965).

12. The only published source on his life is Albert Dehner Bell, *The Life and Times of Dr. George de Benneville, 1703–1793* (Boston: Department of Publications of the Universalist Church of America, 1953). In outline, this account largely corresponds to that given by Müller-Jahncke, "Die Medicina Pennsylvania," although he too points to the lack of conclusive documentation. For the so-called French prophets and their European history, see Hillel Schwartz, *The French Prophets: The History of a Millenarian Group in Eighteenth-century England* (Berkeley: University of California Press, 1980). Studies by Friedhelm Ackva and Christa Habrich describe a fractious but illustrious group of radical Pietist thinkers and physicians at Siegen, Berleburg, and at the court of Count Sayn-Wittgenstein during the 1730s, including not only Carl but Dippel, who wrote under the name Democritus Christranus. See Ackva, "Der Pietismus in Hessen, in der Pfalz, im Elsass und in Baden," in *Der Pietismus im 18. Jahrhundert,* vol. 2 of *Geschichte des Pietismus im Achtzehnten Jahrhundert,* ed. Martin Brecht and Klaus Deppermann (Göttingen: Vandenhoeck & Ruprecht, 1995), 212 ff. and Habrich, "Untersuchungen zur pietistischen Medizin und ihrer Ausprägung bei Johann Samuel Carl und seinem Kreis" (unpublished habilitationschrift,

Ludwig-Maximilians-Universität, Munich, 1982).

13. In addition to Abraham Wagner and de Benneville, the circle included Adolph Meyer, a Moravian physician, and Christopher Wiegner. Christopher Sauer of Germantown, the prominent colonial printer, had cordial relations with some of those groups and carried advertisements for a range of medications in his journal. Heinrich Melchior Mühlenberg, the first and most influential Lutheran minister from Pietist Halle, in turn bought materia medica from Wagner. Wagner's manuscript volume of prescriptions contained both formulae employed by de Benneville and references to Halle Orphanage medicines. Andrew S. Berky, *Practitioner in Physick: A Biography of Abraham Wagner, 1717–1763* (Pennsburg, Pa.: Schwenkfelder Library, 1954); Louis A. Meier, *Early Pennsylvania Medicine: A Representative Early American Medical History, Montgomery County, Pennsylvania, 1682–1799* (Boyertown, Pa.: Gilbert Printing Co., 1976).

14. According to Müller-Jahncke ("Die Medicina Pensylvania"), de Benneville worked with Thomas Say during the later period, although it has not been possible to confirm that. According to Francisco Guerra, Thomas Say (occasionally with Isaac Bartram) advertised in the *Pennsylvania Gazette* and the *Pennsylvania Journal* as well as the *Pennsylvanische Berichte* in the 1750s; see Guerra, *American Medical Biography 1639–1783* (New York: L.C. Harper, 1962). Collaboration with an English-speaking chemist would explain the largely bilingual approach of the *Medicina,* particularly in its copious pharmaceutical and dispensing sections, with Latin nomenclature to facilitate reference for both medically trained and lay persons. Even a superficial comparison of the English and German texts makes it clear that the German was the original version and English the translation in most instances.

15. In its proximity to astrological medicine, the de Benneville manuscript recalls some of the later editions attributed to Nicholas Culpeper's *The English Physician,* but Culpeper (or his editor) was far less concerned with a methodical and full schematic of diseases and distinguished more closely between a knowledgeable and a vulgar audience (the former being "such as study astrology"); see Culpeper, *English Physician* (London: A. Bettesworth and C. Hitch, 1733), 385.

16. Benneville's instructions for pulvis panacea were: "Take of Antimoni Crudum, ounces X. Nitri 10 ounces, Tartar Crudum 10 ounces, Sal Commune ii ounces, Carbo iii ounces, Pound Everey one in Particular very fine, Then mix the same in a big Iron pot and Spread it thin about and Detonated *[sic].* Then pound it whilst warm, and Carry it By a Table spoon full at a time, In a red hot Crucible, When that Flows Clear, then put a other Table Spoon full and so keep on till all is in, Then cover the Crucible with a Earthen Foil and cover the whole with Burning Coals, Keep it in the Infusion for a quarter of an hour, Then take it out , and pour it in a warm greassed mortar. Then let it grow cold and Seperate the regulus from the Other and keep it for other use, reduce the other into powder. Then Boil the same one hour in a Gallon of water, and having in a other Vessel one pound of Cremor Tartar Pulveris'd in a Gallon of water. Boil it till that it melts. Then pour the two Solutions together in a big Earthen well glased Vessel, Cover it well, Then Let it Stand for two days, Then Filter it Through Brown paper, and Edulcorated *[sic]* first with hot Water, Then with Cold water of each a gallon. Then dry it. This is an Excellent medicin For to Sweeten the Blood and is a Fine purge and Vomit. The dose is 12 Grains Steeped all night in a tea cup full of warm wine or in Flax Seed Tea and take it in the Morning fasting. So often as it works drink Flax Seed tea upon it" (*Medicina Pensylvania,* 55). That panacea closely resembles a well-known remedy of the period, panacea antimoniales, or Lockyer's pills. See J. Worth Estes, *Dictionary of Protopharmacology: Therapeutic Practices, 1700–1850* (Canton, Mass.: Science History Publications, U.S.A., 1990), 147.

17. For bleeding as part of the Pietist armamentarium, see Christa Habrich, "Zur Ethik des pietistischen Artes im 18. Jahrhundert," *Ethik in der Geschichte von Medizin und Naturwissenschaften,* ed. Wolfram Kaiser and Arina Völker (Halle and Wittenberg: Martin-Luther Universität, 1985).

18. Daniel Sennert (1572–1637), a contemporary of van Helmont's, provided a link between the two systems and promoted the value of chemistry in medicine. Debus, *English Paracelsians*; Johanna Bleker, *Die Geschichte der Nierenkrankheiten* (Mannheim: Boehringer Mannheim, 1972), 41–50.

19. Pagel, *Paracelsus,* 153–58.

20. Ibid., 158.

21. Ibid., 157.

22. Most recently John M. Riddle, *Contraception*

and Abortion from the Ancient World to the Renaissance (Cambridge, Mass.: Harvard University Press, 1992).

23. Cecilia C. Mettler, *History of Medicine: A Correlative Text, Arranged According to Subjects* (Philadelphia: Blakiston Company, 1947).

24. For the development of the Paracelsian scheme of urinalysis, see Bleker, *Geschichte der Nierenkrankheiten,* and Debus, *English Paracelsians.*

25. For the conflicting views of Thurneysser and van Helmont, see Bleker, *Geschichte der Nierenkrankheiten.* De Benneville's excruciating attention to observable detail more nearly resembles Thurneysser.

26. Cf. Watson, *Angelical Conjunction,* ch. 4. Paracelsian and chemiatric teachings remained discernible in the folk medicine and hermetic literature of both Europe and North America, but (except for their pharmaceutical armamentarium) had disappeared from the academic medical curriculum by the end of the seventeenth century. See Allen G. Debus, "History with a Purpose: The Fate of Paracelsus," *Pharmacy in History* 26 (1984): 83–96.

27. *Kremers and Urdang's History of Pharmacy,* 4th ed., rev. Glenn Sonnedecker (Philadelphia: J. D. Lippincott, 1976) quotes Paracelsus as stating that disease is caused by "'acrimony,' either acid or alkaline, being in excess or active at the wrong time and leading to a change in the blood, bile or lymph." Saul Jarcho notes that Thomas Willis (1621–1675), in his discussion of quartan fever, asserted that "in this disease the fluid part of the blood becomes acid and tart. It is deficient in spirits and its terrestrial or 'tartareous' component is overactive" (Jarcho, *Quinine's Predecessor: Francesco Torti and the Early History of Cinchona* [Baltimore: Johns Hopkins University Press, 1993], 227).

28. Müller-Jahncke, "*Medicina Pensylvania* des George de Benneville."

29. De Benneville's prescriptions include a few with names similar to those from Halle sources, e.g. a *balsamum vitae,* prepared from benzoin, storax, myrrh, aloe sucotrine, and numerous herbals in "The Best Spirit." He recommended *Tr. Ess. Dulcem* (prepared from sulfur "natrum tartar," and "a Ducat of Gold Made into Small Pieces") as a "fine Medicin in all the Dangerest Disorders [and] a Universal Strengthening" (*Medicina Pensylvania,* 41).

30. Christa Habrich, "Therapeutische Grundsätze pietistischer Ärzte des 18. Jahrhunderts," *Beiträge zur Geschichte der Pharmazie* 31, no. 16 (1982): 121–23; Habrich, "Characteristic Features of Eighteenth Century Therapeutics in Germany," *Clio Medica* 22 (1991): 39–49.

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The Traffic in Medical Ideas: Popular Medical Texts as German Imports and American Imprints

David L. Cowen and Renate Wilson

There was a good-sized audience for medical self-help texts in the German communities in North America during the eighteenth century.[1] Translations of English-language texts into German were the exception rather than the rule: a translation of John Tennent's *Everyman His Own Doctor* competed with a plentiful supply of German and Swiss almanacs containing medical advice. Almanacs were a substantial component of the output of the press of both father and son Christopher Sauer and probably took the German slice of the market from Benjamin Franklin's *Poor Richard's Almanac*.[2] The popularity and continuous publication of those almanacs have tended to obscure the demand for more learned texts among a German population that grew considerably in size, wealth, and geographic dispersion in the three decades between 1745 and the Revolution.[3]

The Upper End of the Medical Market

Of particular interest is Christian Friedrich Richter's *Höchst-nöthige Erkenntnis des Menschen, sonderlich nach dem Leibe und natürlichen Leben*.[4] Famous in Protestant Europe as a product of the highly respected Francke Foundations Orphanage at Halle, the book reached North America in a number of ways. Some came in the baggage of German practitioners, and some came through the general distribution network of the *Hallesche Medikamenten-Expedition* attached to the Orphanage Foundations. The flyleaf of a 1737 edition bears the name of a German physician in South Carolina.[5] The administrative correspondence of the Halle Orphanage pharmaceutical business refers throughout the eighteenth century to trade through Holland with the West Indies, which in colonial trading terms included North America. Finally, a well-documented source of imports was through Pietist Lutheran clergy and their associates—Reformed and Anglican clergy practicing medicine and other medical practitioners—who assumed guidance of many German Lutheran congregations in Georgia, Pennsylvania, New Jersey, Virginia, Maryland, and New York. The text was shipped to and used in the Georgia Salzburger settlement and its neighboring communities from 1735 onwards.[6] A legacy destined for the Georgia settlement by a European donor was paid off in the early 1800s in part by Halle medicines and texts, both of which seem to have enjoyed particular favor by housewives and others attending women in labor.[7] In Pennsylvania and

New Jersey, direct imports of books and medications from Halle began in the 1740s through the head of the German Lutheran community in North America, Heinrich Melchior Mühlenberg, and his wife Anna Maria, a daughter of the famous Indian scout and influential Pennsylvania political figure Conrad Weiser. The trade continued through the network of Lutheran ministers until the early 1800s.[8]

Orders for the original C. F. Richter text declined after the 1750s but were replaced by the more compact revision by one of his successors, the physician David Samuel von Madai. The condensed edition reduced the original by more than half and, reflecting the geographic range of the pharmaceutical trade of the Orphanage, made the text more widely accessible by translations into Latin and many European languages, including French and Dutch.[9] American orders after 1750 were mainly for the shorter volume, in Latin and French as well as in German, indicating demand outside German-language communities. Orders for the texts by central European medical practitioners seem to have peaked at about the time of the Revolution, which interrupted the flow of European imports and ended the partial customs exemption enjoyed by the Halle Pietists as a missionary and charitable enterprise.[10] Approximately three hundred copies of the Richter and the Madai texts had been sold separately and as part of a set of physic chests through that network by the 1770s. Even after the War of Independence, book imports from Halle did not cease. The more affluent settlers began to acquire natural history and related works, and the shorter medical text continued to be sold until well into the nineteenth century.

The original Richter work combined a traditional instructional approach with appeals to the Christian reader and promotions for the many medications produced at the Halle Orphanage. It began with a treatise on anatomy and physiology, body and mental functions, and states and causes of disease, leading to a large therapeutic section that served mainly as a vehicle to provide indications and dosages for the use of the orphanage medications. All sections, however, were prefaced by lengthy addresses to the Christian reader that invoked the goals of Halle Pietism and its work of universal reform. The author explained that he and his associates had written the text primarily to impress upon their audience, in the familiar terms of biblical reference, that while God reigned over health and illness, both physicians and patients had the divinely-inspired duty to preserve, maintain, and restore health.

> [S]uch are the body and its members, being equipped with such form and structure as enable the soul to fulfill [His] final purpose. . . . But what shall I tell you, oh Reader, of your own body and of how it and your material nature is abused. . . . For it is abundantly clear that *reason* [emphasis in original] is much used against the spirit of the Lord, and while your reason is designed to understand His Being from His works, you perversely deny Him.[11]

That invocation of the soul as the prime mover of the body bears a distinctly Stahlian imprint and was far from inviting a passive acceptance of illness. In many ways, therefore, the *Höchst-nöthige Erkenntnis des Menschen* (The Most Necessary Knowledge of Man) was the perfect vernacular text for the circle of evangelical and other clergy and educated

lay people who brought with them to North America some acquaintance with European medical knowledge and its academic and still partly Latin vocabulary. Richter's nosology and other nomenclature were given both in the traditional Latin and in the German vernacular, providing access to the lay reader while remaining in an accepted professional framework. That the work was fully recognized by the contemporary academic community is shown by its inclusion in the *Deutsche Acta Eruditorum* of 1713.[12]

The intended audience was addressed as "*ungelehrt*" (i.e., without scholarly knowledge) in the rhetorical tradition of Pietist and Puritan reform. That, and the sophisticated and carefully reasoned rationale for the development of the physic chests accompanying the text make it clear that the *Höchst-nöthige Erkenntnis* was an early and enduring part of the instructional genre—the *Populärmedizin*—of the eighteenth century. That genre underwent many permutations in style and level of discourse but changed relatively little in emphasis on specific disease patterns and patient groups defined by age and gender. The *Populärmedizin* provided not only a full course on the nature of the body in its normal and its pathological state but also a therapeutic framework and specific counsel on remedies and cures. The Richter text was still largely oriented to the early modern period and its framework of the humors and their balance, but it belongs to the same genre as William Buchan's *Domestic Medicine* (first published in America in 1772), Samuel Auguste Tissot's *Advice to the People in General* (first published in America in 1771), and subsequent nineteenth-century texts directed at a lay audience by physicians.[13] Those texts were generally shorn of religious content and were usually not constrained by insistence on a set of proprietary medications. An exception was John Wesley's *Primitive Physick,* which belongs almost entirely to the anti-academic evangelical tradition.[14]

The Richter text (and its successor, the Madai manual), therefore, was neither a religious treatise on health directed at the uneducated poor nor a *Pharmacopoeia pauperum,* despite its origin in an eighteenth-century charitable setting.[15] Its relative popularity among segments of the North American colonial German population indicates that assumptions as to the generally humble status of that group may bear some revision. Several recent studies have pointed out considerable and increasing social stratification,[16] which our evidence suggests extended to the use of medical resources.

Even less does it belong among the collections of recipes, secreta, and magic in the folk tradition that had come down in myriad form from the Late Middle Ages through the early modern period. In fact, one of the major objectives of the religious reform movements of seventeenth- and eighteenth-century Europe—of which the German Pietism of Philipp Jacob Spener and Gotthilf August Francke (founder of the Orphanage Foundations) is a major example—was the suppression, once and for all it was hoped, of magic, superstition, and all the traditional remnants of a folk culture that had proved resistant to the efforts of both the Reformation and Counter-Reformation.[17] Despite recent work pointing out the lack of a firm boundary between academic and folk medical texts and practice,[18] the distinction is an important one.

As argued by Wolf-Dieter Müller-

Jahncke, the tradition of astrological and magical medicine eventually moved from the learned elite and their philosophies to populations who felt little need for a cosmological framework for their medicine.[19] In North America, an entirely new print market was created through the lack of church and secular censorship after the Revolution and the lack of enforceable copyright. The common man—and many of the common women—were literate but not learned, and their need was for a range of practical guides that offered various types of traditional folk medicine and secret household recipes. The advantage lay with the printer of books in German type (Gothic or Fraktur), which was the one familiar to North American Germans who carried on the tradition of literacy that "was regarded as normal among artisans" in the early modern period.[20] The Sauer printers had a monopoly in part due to the possession of a full set of Gothic type presented by a Frankfurt printer early in the eighteenth century. The American market opened up to German printers during the 1780s and proved remarkably viable, although complete sets of Gothic type remained scarce until well beyond the end of the century. German texts increasingly appeared from American presses in Pennsylvania and Maryland.[21]

By contrast, Richter's *Höchst-nöthige Erkenntnis* and Madai's translations were never reprinted in the colonies, despite a plethora of German-American imprints after 1790 that indicated an interest in medical guides (see Table). Apparently, the wide range of early modern as well as contemporary medical and veterinarian reprints was more appealing to both the settled and new German immigrants.[22] Those traditions—and the wider and more popular spectrum of advice offered by the other texts—won out over the highly structured and specifically medical perspective of the Richter guides.

Why was the Richter not reprinted? Plagiarizing was clearly not a deterrent to Pennsylvania printers and authors, nor were copyright restrictions of significance: the Pennsylvania printers published works that had appeared in Germany even after Richter's work first appeared.[23] Mühlenberg had requested permission to set up a printing shop on the Halle model in the 1750s, but the Orphanage guarded its property jealously.[24] More important, the deliberate and almost exclusive focus of Richter and Madai on their own medications was bound to limit their appeal despite the persistence even in North America of at least some loyal customers. When American prices rose and European supplies became limited during the political and economic shifts of the Napoleonic era, the availability of the Halle medications through general trading channels decreased.[25]

The Transmission of European Folk and Lay Medicine

Thus, the majority of German-language domestic and veterinary guides printed in the Pennsylvania area after the Revolutionary War were of the folk medicine variety. One of the most popular of those, reprinted frequently from 1555 until 1699, contained the medical recipes of Alessio Piemontese's *Secreti*; a German translation was made by Johann Jacob Wecker in 1573.[26] According to William Eamon, such books belonged to the "alternative pharmaceutical tradition that bore almost no relation whatsoever to classical pharmacology."[27] The Richter recipes, although likewise "secret," were more in keeping with official pharmacopoeias and

German-Language Domestic and Veterinary Medical Imprints Published in the British North American Colonies and the United States, 1749–1820

(Not including almanacs, broadsides, and promotional literature)

Category	1730–1769	1770–1789	1790–1799	1800–1810	1810–1820
Domestic Medicine	1		3	1	
Veterinary Medicine		3	1	7	3
Combined Domestic and Veterinary Medicine			11	1	5
Female Guides			5	5	3
Handbooks			3		3
TOTALS	1	3	23	14	14

SOURCES: Karl J. R. Arndt and Reimer C. Eck, eds., *The First Century of German Language Printing in the United States of America: A Bibliography Based on the Studies of Oswald Seidensticker and Wilbur H. Oda*, 2 vols. (Göttingen: Niedersächsische Staats- und Universitätsbibliothek, 1989); David L. Cowen, "Zum Dienst des Gemeinen Mannes, insonderheit für die Landleute': The Domestic and Veterinary Medical Books Printed in Colonial North America and the United States in the German Language," in *Orbis Pictus: Kultur-und pharmaziehistorische Studien: Festschrift für Wolfgang-Hagen Hein zum 65. Geburstag*, ed. Werner Dressendörfer and Wolf-Dieter Müller-Jahncke (Frankfurt am Main: Govi-Verlag, 1985), 60–66.

the medications traditionally to be found in pharmacies.

The output of the Pennsylvania German printers was a resurrection of the *Kunstbüchlein* and "books of secrets" of sixteenth-century Europe. Medically outstanding in that era had been Walther Hermann Ryff, author and plagiarist of forty-three books between 1538 and 1558, among them such works as *Prakticir Büchlein der Leibartzeney* (1541) and *Der ander theyl der kleynern teutschen Apoteck* (1542).[28] His *Confect Buch und Hauss Apotheck* was published no fewer than ten times between 1543 and 1610.[29] Ryff's "vulgarization" drew bitter criticism from academic medicine, but in 1569 a bookdealer at the Frankfurt Fair sold 227 copies of his *Das Handbüchlein Apollinarius*—the second most popular of the books he sold.[30] Thus, Pennsylvania Germans were reproducing and buying a type of literature that had a long tradition and popularity not only in Germany but in all of Europe. As noted, the Pennsylvania printers had little compunction about reprinting works that had appeared in the mother country.

Twenty years elapsed between the American publication of the German

translation of John Tennent's *Everyman His Own Doctor* in 1749 and the publication of the first of the domestic medical and veterinary books of German or German-American origin printed in America in the German language. Johannes Deigendesch's *Nachrichters: Oder Nützliches und aufrichtiges Ross-Arzney-Büchlein* was printed by Sauer in Germantown in 1770. A profusion of publications on veterinary medicine, domestic medicine, and female health followed, some of which—while bearing local imprints—might have been printed in Germany.[31] Altogether, at least twenty-nine different titles (in at least fifty-five issues) were published between 1770 and 1820 (see Table), and more than twenty-five new titles appeared between 1821 and 1865.[32] As Tobias Hirte pointed out in 1792, books by learned scientists and physicians were costly and difficult to come by.[33] Given the paucity and inaccessibility of trained physicians,[34] those publications were said to fill a pressing need. Each housewife became a "*Doctorin,*" lamented one anonymous author, "and everything superstitious that has occurred to God or man is sought out, used, and brings the patients more quickly to grief."[35]

Those publications represent an interesting facet of the transatlantic migration of European civilization. Like the great mass of immigrants, the Germans who settled in the mid-Atlantic region were commoners and rural folk—*gemeine Männer und Frauen* and *Bauern*—who had ventured from home as much for economic reasons as for religious ones. They brought with them traditions, superstitions, and credulities that went back several centuries.[36] Deigendesch's *Nachrichters,* for example, was published four times in Pennsylvania between 1770 and 1823. It had first appeared in Freiburg in 1716 and was printed in Germany and Switzerland at least seven times thereafter, the last in 1857.[37] *Der barmherzige Samariter* by Eliam Baynon (Beynon) was published in Hannover, Pennsylvania, in 1798; it was first published in Germany in 1670 and had no fewer than twelve issues in German, French, and Danish between 1670 and 1702.[38] The early issues of the *Kurzgefasstes Arzney-Büchlein*—published in Ephrata in 1791, 1792, and 1793—carried the imprint "*Wien gedruckt, in Ephrata nachgedruckt*"; it has been traced to one published in Dresden in 1687.[39] The oft-reprinted and oft-translated *Der lange verborgene Freund* by Johann Hohman (Hohmann), which first appeared in Reading in 1819, copied long sections from a *Romanusbüchlein* published in Graz in Styria thirty-one years earlier.[40]

The female guides, small works in gynecology and midwifery, also display a lengthy ancestry. They can probably be traced back to a work by Henricus de Saxonia, a student of the celebrated medieval philosopher and theologian Albertus Magnus of Cologne. Called *De secretis mulierum,* it appeared in print at the end of the fifteenth century, attributed to Albertus Magnus but containing commentary by Henricus.[41] A German version by Ryff appeared in 1549.[42] The American versions appeared under four titles: two specifically claimed on their title pages that they included the secrets of Aristotle and Albertus Magnus,[43] while the other two were obviously similar in text. Altogether, at least ten or twelve issues were published between 1796 and 1822.[44] A similar work, attributed only to Aristotle, with titles like *Aristotle's Master Piece,* appeared first in England at the end of the seventeenth century. It went through thirty-two American editions in English between

1766 and 1831.[45] A possibly English influence on the German-American publications is indicated by the fact that several issues of the *Kurzgefasstes Weiber-Büchlein,* which first appeared in 1798, included passages purportedly from Culpeper.[46]

As indicated earlier, the veterinary and domestic medicine publications were folk medicine and, unlike the Richter-Madai works, were specifically directed to the common man. Whereas the title page of a 1705 text by Richter suggested that even the unlearned could learn to recognize what good health is (*"auch Ungelehrter erkennen kann was die Gesundheit ist"*),[47] the Pennsylvania imprints indicated that they were "especially for the use of the countryman,"[48] "for the farm people,"[49] "for the young countryman,"[50] and for our "poor, forsaken and needy fellow creatures."[51]

Again, where Richter titled his book the "Necessary Understanding," Baynon's 1789 work was called "Compassionate Samaritan; or Friend and Brotherly Advice" (*Barmherzige Samariter),* Hirte called his 1793 book "Friend in Need" (*Der Freund in der Noth*), and Hohman called his 1819 book "Long-Hidden Friend, or True and Christian Instruction" (*Der lange verborgene Freund oder: Getreuer und Christlicher Unterricht).* The ad hominem character of the Pennsylvania imprints is apparent. Although they recognized the role of God and of nature, they showed little interest in etiology and frequently attributed disease to bewitchment, enchantment, or violation of taboos. Some authors advised that horehound, artemisia, red garlic, and asafetida bound together and buried under the doorsill could ward off an avenging witch or enchanter.[52] Others warned that sties could result from defecation along the roadside.[53]

Given the Old World origins of the Pennsylvania books, the replication of folk medicine is not unexpected. They were essentially how-to books, although a few later works would display a more professional and learned approach. Simple remedies, readily available in the home or on the farm, abounded. Those were largely herbal, and prescribed and administered in a "homey" fashion. When physician Sebastian Kunckler left for Philadelphia in 1794, for example, he advised his patients in the Mohawk Valley of New York to take a tea of camomile and honey for fevers and sweating and to make a "plaster of rotten apples, warmed and mashed, for a stitch in the side."[54] Johann Hohman recommended crushed garlic for corns.[55] Polypharmacy does not seem to have been common, although some of Baynon's recipes called for eleven to fourteen ingredients, and the Mithridate appeared there as well.[56]

The commonly used mineral substances of the early modern period (alum, antimony, mercury, and arsenic), as well as chemicals (sublimate of mercury, sal amoniac, vitriol, red lead, lye, and litharge of silver), as well as plant drugs were to be found in those books. But there was also a wide variety of medicaments from the animal world that was reminiscent of the *Dreckapotheke* that had virtually attained professional status in Germany by the work of that name by Christian Paullini in 1696.[57] Especially noticeable in veterinary uses, crude and inelegant to the twentieth-century observer, such materials were also found in domestic practice.[58]

Thus, like official compendia of the early modern period, the Pennsylvania books reflected the universal notion that everything and anything had a place in the materia medica. Hohman, on the same

page, gave remedies based on sublimated quicksilver, camomile flowers, and hareskin.[59] The more traditional pharmacy was not neglected, however. *Vollständiges Gäuls-Doctor-Buch* by the noted German veterinarian Johann Nicolaus Rohlwes contained a list of sixty *Arzneimittel* that could be found in almost any eighteenth-century pharmacopeia and dispensatory; later publications continued the practice.[60] Kunckler recommended that the householder provide himself (perhaps better, herself) with eleven basic medicines procured at the apothecary shop: rhubarb powder, senna leaves, manna, saltpeter, Peruvian bark, orange peels, camomile flowers, anise seeds, pink root, essence of mint, and court plaster.[61] A vast array of calendar and almanac literature also offered medical advice.[62] Outstanding among them was a series published by Christopher Sauer Jr. in Germantown between 1762 and 1778, in which he recommended 266 plants from Theodor Zwinger's 1696 *Theatrum Botanicum.*[63]

The Germans of Pennsylvania brought with them fears and credulities of very ancient origins. Occult practices developed alongside the more rational stream of domestic medicine. Again, a difference between the Richter approach and that of the later Pennsylvania German imprints is evident. The Richter approach reflected the clerical opposition to occult practices; in the eighteenth century those practices had become "lodged in the folk segment of the population."[64] Thus the early issues of the *Kurzgefasstes Arzney-Büchlein* carried a "Prognostical Table" on its title page found in the Royal Library and said to have come from Egypt.[65]

A related notion was that certain remedies could be given only on propitious days, particularly those related to the Zodiac or phases of the moon. Deigendesch's complicated directions for a bag of herbs to be hung on a horse with the wasting disease, for example, required actions on "St. John's Day when the clock strikes twelve," on three days before the new moon, and on the waning of the moon.[66] Hohman's remedy for a wasting fever required slaughtering an entirely black calf in the month of April "exactly at the hour in which the new moon rises."[67]

Superstition merged into magic. There appeared what the Pennsylvania Germans knew as *Bräuche* books, which provided remedies based largely on exorcisms and incantations. The *Bräuche* remedies found their way into the domestic remedy books as well, and the books were used as handbooks for the powwow, under the guidance of a powwow doctor, an indication that German immigrants were not adverse to absorbing some Native American practices.[68]

Another aspect was the persistence of the idea of sympathetic magic—the transference of an ailment or an evil to something else—an idea that had a basis in neo-Platonic and hermetic circles as well as folk medicine.[69] As the anonymous author of the *Neuer erfahrner, amerikanischer Haus- und Stallarzt* stated, it was one of the "many secrets under the sun that used correctly work magnificently."[70] Two forms of sympathetic magic are found in the Pennsylvania German literature. One is the use of sympathetic powder and sympathetic ointment, concoctions mainly (in Deigendesch) of calcined vitriol and tragacinth. The medicament was not to be applied to the wound but either to the instrument or weapon (thus "weapon salve") that had inflicted the wound or to a cloth dipped into the blood or fluid from the wound. Another sympathetic medica-

ment could be obtained by rolling up in paper hairs from various parts of a horse's body, then placing the roll in a hole drilled into a young tree (on the third day of the new moon, according to Deigendesch). As the hair rotted in the tree, the horse's condition would improve. Related to the notion of sympathy was the doctrine of signatures, wherein God indicated (or "signed") by coloration, shape, taste, or otherwise, certain natural products for the healing of analogous ailments. The doctrine was universal, and it received professional attention in Michael Bernhard Valentini's *Medicina Nov-Antiqua,* published in Frankfurt in 1698 and 1713.[71] Deigendesch's use of lungwort for lung disease in cattle, sheep, and horses, is an example of how the doctrine was applied.

Signs of modernization were discernible in the literature, however, and texts from more recent publications found their way to the American reader, especially in nineteenth-century veterinary literature. Henrich Neff's *Das durch viele Curen bestätigte und sicher befundene Pferdearzney-Büchlein* (1804) supports his claim to long knowledge and experience in veterinary medicine.[72] The apothecary-physician John Eberhard Freitag, in the preface to his *Der Deutsche Pferd-Arzt,* stated, in 1809: "Many people have asked me if I did not have certain remedies that one can place in the stall, or hang on the horse, that would always keep him healthy. The answer is always, and will always remain, take good care of your horse, that is the best means of preservation."[73] A new professional spirit can be recognized in Freitag's work and was even more discernible in the publication of Rohlwes's *Allgemeines Vieharzneibuch* in Reading in 1817.

Conclusion

The German medical texts used by German-speaking people in North America, particularly in Pennsylvania and adjoining areas, reflected a wide range of traditions and practices brought over from the homeland. During the colonial period, American imprints were relatively few and centered on the few publishers, like the Sauers, who had secured Gothic type. Much medical literature was imported, including medical journals and texts intended for the educated layman. Eventually, beginning with the expansion of local presses after the Revolution, there were lower-priced books of more practically oriented domestic medicine, homey medicine, and folk medicine that made a place for excremental pharmacy, superstition, charms and incantations, and sympathetic magic. All found their way into print. This article has not considered manuscript sources that had an even greater "predilection . . . for the curious and the occult."[74]

That the Richter did not find an American printer during the later part of the period under discussion may be due to a number of circumstances, including changes in the attitudes and practice of local physicians and a turn toward English and Scottish models after the founding of the College of Physicians in Philadelphia. But while the upper end of the German market remained dependent on imports from Europe, the local demand for traditional publications in German (printed in familiar Gothic type) is obvious both from their number and their frequent reprinting and from the plagiarism that was rampant. Of the many printings of the *Kurz gefasstes Arzney-Büchlein* that appeared between

1791 and 1803, "Thousands of them were sold in a short time, and are still agoing," boasted the publisher in a prefatory note to *The Cheap and Famous Farrier,* a quite different book he was issuing for English readers in 1795.[75] Appended to Hohman's *Land- und Haus-Apotheke* (1818) is a list of more than seven hundred subscribers in forty-six communities—an extraordinary feat of marketing. The popularity and demand for those books is also indicated by how often some were reprinted, albeit under different titles or authors, without the benefit of informing the public that they were re-issues of earlier works. In whole or in part, the *Kurzgefasstes Ross-Arzney Büchlein,* first printed in 1802 and twice reprinted, was appropriated three times thereafter.[76] *Neuer erfahrner, amerikanischer Haus- und Stall-Arzt* (1794) was also appropriated three times.[77] Neff's *Durch viele Curen* of 1804 was published under a very similar title but attributed to a different author two years later.[78] The same process prevailed among the *Weiberbüchlein,* as previously noted.

Lest it appear strange to the twentieth-century observer that a literate people—as the Germans in America were—would put credence in such a hodgepodge of remedies, it needs to be noted that in the 1650s the philosopher John Locke, then studying medicine at Oxford, copied a formula for sympathetic ointment into his commonplace book.[79] The official pharmacopoeias of the seventeenth century and well into the eighteenth century contained lists of *partes animalium* that were not too different from Deigendesch's cabinet of horrors. The Mithridate was not expunged from any pharmacopoeia until 1752, and vestiges of that hoary polypharmaceutical were still to be found in the nineteenth century.[80] Folk medicine makes use of the articles at hand in the search for health and comfort, relying heavily on tradition, experience, and faith. That is not an unreasonable approach when even trained physicians and their patients—including the audience of the Richter texts—had little else to rely on than laxatives, emetics, blisters, and the whole armamentarium of traditional medicines. To quote Johann Christian Friedrich Düffer, a student of Christian Wilhelm Hufeland's and a general practitioner and teacher at the Halle Medical School, from the 1808 edition of the Richter text:

> We do not deny that the widespread use of the Halle medications is in part based on a kind of innate feeling and a certain faith. . . . While this cannot be evidence of their worth in the eyes of a physician, in fact it does not differ from the often unconditional faith of the sick in a remedy proven by long experience, or in a well regarded general practitioner whose prescriptions one accepts without question.[81]

♦

Notes

1. Based on generally accepted estimates of German immigration into North America over the eighteenth century, an estimate of roughly ten thousand families is not unreasonable; see Hans Fenske, "International Migration: Germany in the 18th Century," *Central European History* 13 (1980): 332–47, and Marianne Wokeck, "The Flow and Composition of German Immigration to Philadelphia, 1727–1755," *Pennsylvania Magazine of History* 105 (1981): 244–78. Of those families, at least 60 percent would have had a literate male or female member either owning or sharing medical information in printed form.

2. German almanacs came both as imports and as American imprints. For American imprints, see Karl J. R. Arndt and Reimer C. Eck, eds., *The First Century of German Language Printing in the United States of America: A Bibliography Based*

on the Studies of Oswald Seidensticker and Wilbur H. Oda, 2 vols. (Göttingen: Niedersächsische Staats- und Universitätsbibliothek, 1989); for an American almanac published annually by a Swiss printer, see Johannes Tobler, *Alter und verbesserter Schreib-Kalender auf das G. Gnadenreiche Christ-Jahr MDCCLV . . .* (St. Gallen: Hans Jacob Hochreutiner, 1754).

3. For the wide range of topics in demand, see, most recently, Robert E. Cazden, *A Social History of the German Book Trade in America to the Civil War* (Columbia, S.C.: Camden House, 1984), Ch. 1, 10–12, 17 ff., and A. G. Roeber, "The German- and Dutch-language Book in North America to 1800," in *A History of the Book in America, Volume I,* ed. Hugh Amory and David D. Hall (forthcoming from Cambridge University Press).

4. Christian Friedrich Richter, *Seeligen Hn. D. Christian Friedrich Richters Höchst-nöthige Erkenntnis des Menschen, sonderlich nach dem Leibe und natürlichen Leben, oder ein deutlicher Unterricht, von der Gesundheit und deren Erhaltung; auch von deren Ursachen, Kennzeichen und Namen der Krankheiten, damit ein jeder, auch ungelehrter bei Ermangelung eines Medici, sonderlich durch XI hierzu hinlänglich erfundene, und Gebrauch dieses Traktats, vermöge bisheriger reicher Erfahrung die gewöhnlichen, auch schweren Krankheiten sicher und mit gutem Success kurieren könne, nun zum viertenmale gedruckt und herausgegeben von D. Christian Sigismund Richter und D. Johann Wolfgang Künstlin, Med. Prac. in Halle* (Leipzig: Johann Friedrich Gleditsch und Sohn, 1712) and many subsequent editions published in Halle by the Orphanage press. A shorter version had been published in 1705 as *Kurzer und deutlicher Unterricht vom Leibe und natürlichen Leben . . .*, republished by Hans Joachim Poeckern, *Die Halleschen Waisenhausartzeneyen* (Leipzig: Edition Leipzig, Bibliotheca Historico-naturalis Antiqua, 1984). A full listing of all editions is in Eckhard Altmann, *Christian Friedrich Richter (1676–1711): Arzt, Apotheker und Liederdichter der Halleschen Pietisten* (Witten: Luther Verlag, 1972).

5. The inscription, dated 1741 and by Dr. Christian Dürfeld of Saxe-Gotha, is in a copy at the National Library of Medicine; that library holds numerous editions of both the Richter and the Madai, five of which were acquired at the end of the nineteenth century from American private holdings.

6. Renate Wilson, "Die Halleschen Waisenhausmedikamente und die 'Höchst nöthige Erkenntnis' im Amerikanischen Kolonialstaat Georgia," *Schriftenreihe für Geschichte der Naturwissenschaft, Technik, und Medizin* 28 (1991): 108–28; Renate Wilson and Hans Joachim Poeckern, "A Continental System of Medical Care in Colonial Georgia," *Medizin, Gesellschaft und Geschichte: Jahrbuch des Instituts für Geschichte der Medizin der Robert Bosch Stiftung* 9 (1992): 99–126.

7. See Renate Wilson, "The Traffic in Halle Orphanage Medications: Medicinals, Philanthropy, and Colonial Mission," in this issue.

8. The 1740–1808 transactions are documented in the following two record sets of the Francke Foundations archives: IV, Pennsylvania, series G and F; and V, Georgia, series D and E, Missions-Archiv der Franckeschen Stiftungen, Halle.

9. E.g., David Samuel von Madai, *Kort bericht van de nuttigheid en 't gebruik van eenige beproefde geneesmiddelen* (Amsterdam: n.p., 1760). According to Belint Keserü, the only translation of Richter's original work and Madai's condensed text was into Latin, which remained the scientific lingua franca in Russia and throughout East and Southeast Europe until the nineteenth century; we thank Dr. Keserü for that information.

10. Wilson and Poeckern, "Continental System."

11. Richter, *Höchst-nöthige Erkenntnis,* 5, 7.

12. *Deutsche Acta Eruditorum,* 20 vols. (Leipzig: J. F. Gleditsch und Sohn, 1712–1739), 10:875, as cited in Altmann, *Christian Friedrich Richter,* 216.

13. Samuel Auguste Tissot, *Advice to the People in General, with Regard to Their Health . . .* (Philadelphia: Sparhawk, 1771); William Buchan, *Domestic Medicine* (Philadelphia: John Dunlop, 1772). For continuity into the nineteenth century, see Elizabeth Barnaby Keeney, "Unless Powerful Sick. Domestic Medicine in the Old South," in *Science and Medicine in the Old South,* ed. Ronald L. Numbers and Todd L. Savitt (Baton Rouge: Louisiana State University Press, 1989), 276–94.

14. John Wesley, *Primitive Physick: or, An Easy and Natural Method of Curing Most Diseases* (Philadelphia: Crukshank, 1770). On the traditional anti-academic stance of many radical Christian groups, see Charles Webster, *The Great Instauration: Science, Medicine and Reform, 1626–1660* (London: Duckworth, 1975).

15. The radical Pietist physician Johann Samuel

Carl did, however, publish a *Medicina pauperum oder Armen-Apotheck* (Büdingen: n.p., 1719).

16. A. G. Roeber, *Palatines, Liberty, and Property: German Lutherans in Colonial British America* (Baltimore: Johns Hopkins University Press, 1993), 243–82; A. G. Roeber, "J. H. C. Helmuth, Evangelical Charity, and the Public Sphere in Pennsylvania, 1793–1800," *Pennsylvania Magazine of History and Biography* 121, nos. 1–2 (1997): 77–100.

17. Jon Butler, *Awash in a Sea of Faith: Christianizing the American People* (Cambridge, Mass.: Harvard University Press, 1990).

18. Andrew Wear, "The Popularization of Medicine in Early Modern England," in *The Popularization of Medicine, 1650–1850,* ed. Roy Porter (London: Routledge, 1992), 17–41; John Scarborough, "Introduction," in *Folklore and Folk Medicines,* ed. Scarborough (Madison, Wis.: American Institute of the History of Pharmacy, 1987).

19. Wolf-Dieter Müller-Jahncke, *Astrologisch-magische Theorie und Praxis in der Heilkunde der frühen Neuzeit,* in Sudhoffs Archiv: Zeitschrift für Wissenschaftsgeschichte, vol. 25 (Stuttgart: Steiner Verlag Wiesbaden, 1985), 121–33.

20. William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994), esp. 122–24, offers a persuasive reassessment of literacy in the early modern urban artisanate. The continued preference for Gothic type in the eighteenth century was not limited to Germans whose reading experience was largely based on the Luther Bible but apparently included settlers of Dutch origin, mainly among the lower strata. According to Paul Hoftijzer at Leiden University, Dutch book production went over to Roman type only at the beginning of the nineteenth century and had coexisted with Gothic type in a large proportion of Dutch books, pamphlets, broadsheets, etc. We thank Professor Hoftijzer for that information, and Professor Harold Cook for information on the parallel use of Gothic and Roman type in Dutch seventeenth-century imprints in the vernacular.

21. For the Sauers and their German press, see Hans-Jürgen Schrader, *Literaturproduktion und Büchermarkt des radikalen Pietismus: Johann Henrich Reitz, "Historie Der Wiedergebohrnen" und ihr geschichtlicher Kontext* (Göttingen: Vandenhoeck and Ruprecht, 1989), 225–26. For German book trading practices and American presses, see Cazden, *Social History,* 8 ff., 16–17.

22. For recent work on the continuing if much smaller immigration streams from Germany from 1790 to 1820, see Hans-Jürgen Grabbe, "Besonderheiten der europäischen Einwanderung in die USA während der frühen nationalen Periode, 1783–1820," *American Studies* 33 (1988): 271–90. There is little information on the social and educational stratification of American groups of German extraction during that period, however, and we do not know to what extent the Richter texts had been fully replaced by works in the style of Buchan and Tissot.

23. E.g., Johannes Deigendesch's *Nachrichters: Oder Nützliches und aufrichtiges Ross-Artzney-Büchlein,* published in Freiburg in 1717, was printed in Germantown in 1770 and three times thereafter.

24. Kurt Aland, ed., *Die Korrespondenz Heinrich Melchior Mühlenbergs: Aus der Anfangszeit des Deutschen Luthertums in Nordamerika,* vol. 1 (Berlin: W. de Gruyter, 1986), 288–89, 303 ff.; Mühlenberg to Benjamin Franklin, Aug. 3, 1754, in *The Papers of Benjamin Franklin,* Vol. 5, ed. Leonard W. Labaree and Whitfield J. Bell Jr. (New Haven: Yale University Press, 1962), 419.

25. See Renate Wilson in this issue.

26. The *Secreti del reverendo donno Alessio Piemontese* was first published in Venice in 1555. Johann Jacob Wecker, *Kunstbüch des wolerfarner Herren Alexii Pedemontani von mancherley nützlichen undd bewerten Secreten oder Künsten* (n.p., 1573).

27. Eamon, *Science and the Secrets of Nature,* 144.

28. Ibid., 96–97, 444; John Neu, ed., *Chemical, Medical, and Pharmaceutical Books Printed Before 1800 in the Collections of the University of Wisconsin Libraries* (Madison: University of Wisconsin Press, 1965), 228.

29. *National Union Catalog: Pre-1965 Imprints,* 754 vols. (London: Mansell, 1968–), 512:423–24. His works were reprinted long after his death.

30. Eamon, *Science and the Secrets of Nature,* 124. The precise title of this *handbüchlein* has not been determined; a later issue was called *Handbüchlein, vnd Experiment vieler Arzneyen . . . durch den hochgelehrten Q Apollinaren selbs erfahren vnd bewert* (Strasburg: Erbern, 1579).

31. Cazden, *Social History,* 10–11.

32. Arndt and Eck, eds., *First Century of German Language Printing*; David L. Cowen, "'Zum Dienst des Gemeinen Mannes, insonderheit für die

Landleute': The Domestic and Veterinary Medical Books Printed in Colonial North America and the United States in the German Language," in *Orbis Pictus: Kultur-und pharmaziehistorische Studien: Festschrift für Wolfgang-Hagen Hein zum 65. Geburstag,* ed. Werner Dressendörfer and Wolf-Dieter Müller-Jahncke (Frankfurt am Main: Govi-Verlag, 1985), 60–66.

33. Tobias Hirte, "Vorrede," in *Ein neues, auserlesenes, gemeinnütziges Hand-Büchlein* (Germantown: Saur, 1792).

34. Sebastian Kunckler, "Vorbericht," in *Handbuch für meine Freunde in den Districten von Canajohary und Palatine an der Mohawk-River: zur Erhaltung und Wiederstellung der Gesundheit* (Philadelphia: Carl Cist, 1794). As Buchan expressed the idea in his ubiquitous *Domestic Medicine:* "It never was, and, in all probability, never will be in the power of one half of mankind to obtain the assistance of physicians" (vi).

35. "Vorrede," *Neuer erfahrner, Amerikanischer, Haus- und Stallarzt* (Fredericktown: Matthias Bärtgis, 1794). In one edition of *Domestic Medicine,* Buchan warned his readers "to guard themselves against the destructive influences of Ignorance, Superstition and Quackery" (Philadelphia: Richard Folwell, 1799), 16.

36. For example, more than two hundred issues of Ryff were published by European presses in the sixteenth and seventeenth centuries. Eamon, *Science and the Secrets of Nature,* 96; Müller-Jahncke, *Astrologisch-magische Theorie,* 129.

37. David L. Cowen, "Deigendesch's Nachrichters Arzneibüchlein," *Journal of the American Veterinary Medical Association* 139 (1961): 369.

38. *National Union Catalog: Pre-1956 Imprints,* 52:70–71.

39. *Kurzgefasstes Arzney-Büchlein für Mensch und Vieh* (Ephrata, Pa.: n.p., 1791); Robert B. Austin, *Early American Medical Imprints: A Guide to Works Printed in the United States, 1668–1820* (Washington: U.S. Department of Health, Education and Welfare, 1961), 120.

40. Don Yoder, "Hohman and Romanus: Origins and Diffusion of the Pennsylvania German Powwow Manual," in *American Folk Medicine: A Symposium,* ed. Wayland D. Hand (Berkeley: University of California Press, 1976), 238; Johann G. Hohman, *Der lange verborgene Freund oder: Getreuer und Christlicher Unterricht für Jederman* (Reading, Pa.: n.p., 1819).

41. Albertus Magnus, *Secreta mulierum et virorum (cum expositione Henrici de Saxonia)* (Venice: de Rottweil, 1478); Müller-Jahncke, *Astrologisch-magische Theorie,* 122.

42. Peter Krivatsy, *A Catalogue of Incunabula and Sixteenth Century Printed Books in the National Library of Medicine, First Supplement* (Bethesda, Md.: U.S. Department of Health, Education and Welfare, 1971), 6.

43. *Kurzgefasstes Weiber-Büchlein enthält Aristotles und Alberti Magni Hebammen-Kunst* was published at least five times between 1798 and 1818 by various publishers; *Nützliches und sehr bewährt befundenes Weiber-Büchlein enthält Aristoteles und Alberti Magni Hebammen Kunst* was published in Ephrata in 1822, probably by Baumann.

44. Cowen, "'Zum . . . Landleute,'" 51, 64–65.

45. Otho T. Beall Jr., "Aristotle's Masterpiece in America: A Landmark in the Folklore of Medicine," *William and Mary Quarterly,* ser. 3, 20 (1963): 220.

46. E.g., *Kurzgefasstes Weiber-Büchlein* (Ephrata, Pa.: n.p., 1798); Cowen, "'Zum . . . Landleute,'" 47.

47. Christian F. Richter, *Kurzer und deutlicher Unterricht von dem Leibe und natürlichen Leben des Menschen . . .* (Halle: Im Waisenhause, 1705), title page.

48. *Wohl-eingerichtes Arzney-Büchlein . . . zum Dienst des gemeinen Mannes, insonderheit die Landleute heraus gegeben* (Philadelphia: Henrich Miller, 1771).

49. *Noth und Hülfbüchlein für Bauerleute* (Philadelphia: Neal and Kammerer, 1796), as listed in Charles Evans, *American Bibliography* (Worcester, Mass.: American Antiquarian Society, 1903–), no. 30920. Evans indicates that there is no known extant copy.

50. Hirte, *Neues Hand-Büchlein,* 8.

51. Eliam Baynon, "Vorrede," *Der barmherzige Samariter oder Freund und brüderlicher Rath* (Hannover: Samuel Endredy Stettinius, 1798).

52. Thomas R. Brendle and Claude W. Unger, "Witchcraft in the Cow and Horse," *Pennsylvania Dutchman* 8, no. 1 (1956): 28–29.

53. Thomas R. Brendle and Claude W. Unger, *Folk Medicine of the Pennsylvania Germans: The Non-Occult Cures* (1935; rpt. New York: A. M. Kelley, 1970), 124.

54. Kunckler, *Handbuch für meine Freunde,* 7, 26.

55. Johann G. Hohman, *Die Land- und Haus-Apotheke* (Reading, Pa.: C. A. Bruckman, 1818), 43.

56. Baynon, *Barmherzige Samariter,* 6–7.

57. Franz Christian Paullini, *Heilsame Dreck-Apotheke, wie nemlich mit Koth und Urin . . . alle . . . Schaden . . . curirt worden* (Frankfurt am Main: Friedrich Knochens, 1696).

58. David L. Cowen, "The Folk Medicine of the Pennsylvania Dutch," in *Folklore and Folk Medicines,* 90.

59. Hohman, *Land- und Haus-Apotheke,* 46.

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